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REPORT

OF THE

SECRETARY OF WAR;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE FIRST SESSION OF THE FORTY-NINTH CONGRESS.

IN FOUR VOLUMES.

VOLUME IV.

PART 1.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

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REPORT

OF THE

CHIEF SIGNAL OFFICER.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, October 10, 1885.

SIR: I have the honor to submit herewith my report upon the work of the Signal Service during the fiscal year ending June 30, 1885.

INSTRUCTION.

The course of instruction pursued at Fort Myer has been enlarged and otherwise improved, and it now provides for the theoretical and practical instruction of officers and men of the Signal Service in the duties required of the Signal Corps in time of war. It is the theory that all connected with the corps shall be constantly available for all branches of military service for which the Signal Corps is maintained. The signal corps and telegraph train is now recognized by all foreign powers as most essential in modern warfare. In active service the duties require the men to be mounted and the trains must be moved by horses. During the past two years not one animal has been at my command, available for this mounted instruction. The field train should be fully equipped in order that the men may be taught to ride and manœuvre a telegraph train in the field.

During the year ending June 30, 1885, five officers and thirty-six men received instruction in the regular course of military signalling at Fort Myer. In May, 1885, a system of field practice was inaugurated for officers and men on duty at the Chief Signal Office, as follows:

Two details, one officer and one enlisted man each, are made daily for practice in all kinds of military signalling, including the heliograph, field telephones, and telegraphs, and for instruction and practice in military surveying, field sketching and mapping. All officers on duty in the office of the Chief Signal Officer, excepting the officers in charge of the Property and Disbursing and Indications Divisions, are required to take this field practice. The details of officers are made in rotation, from a roster containing the names of all the officers available. The practice is conducted under the personal direction of the Chief Signal Officer. Officers are required to furnish their own transportation.

On June 18, 1885, a division of Military Signalling was established under charge of an officer, whose duties are as follows:

The care and improvement of the field telegraph train, heliograph, knapsack-telephone and telegraph, and signal apparatus in general; the preparation of a manual for instruction in military signalling and management of the field-telegraph train; and the supervision of the theoretical and practical instruction in signalling of officers and enlisted men at Fort Myer and at this office. To collate all information possible from American and foreign sources in relation to the foregoing subjects.

When necessary for practice or experiment, this officer should have the use of trains and signal apparatus and equipment at Fort Myer.

During the coming year it is intended to replace the old and worn-out signal equipments, now in use by the Signal Corps and at military posts, with new and approved appliances for visual signalling. Some slight progress was made in this direction during the months of May and June. A small manual for instruction of officers and men in signalling is in course of preparation.

It is the intention, also, to have constructed a section of field-telegraph train similar to the field train now used by the Swedish government, the wagons of which are smaller and lighter than those now used by the Signal Corps, and are therefore better adapted to the rougher roads in this country. Some of the wagons are at present being constructed. The pressure of the constantly increasing and expanding meteorological duties of the bureau has, since 1870, caused the purely military duties and responsibilities of the corps to be somewhat neglected, but it is now proposed to remedy this by vigorous study of the theory and practice of the art of military signals. It is proposed during the coming year to erect two permanent military signal stations with a good range between them of about fifteen miles, and to equip them with the latest and most approved apparatus for visual signalling. These stations will be used for practice and experiment, and will be located with a view to use in actual warfare. The subject of military signalling is at present securing special attention in the armies of Europe, and no labor or expense is spared in perfecting their equipments and field-telegraph trains.

The annual report of the officer in charge of Fort Myer, to which special attention is invited, accompanies this report as Appendix No. 1.

During the year four officers completed the course at Fort Myer, including a theoretical and practical course in cavalry tactics, customs of the service, manual of signals, cipher manual, military surveying, electricity, and electric telegraph. Thirty-one enlisted men were instructed in military signalling, telegraphy, elementary meteorology, and in their duties as soldiers and observers of the Signal Service.

In addition to the above, a course of instruction for officers charged with the preparation of weather predictions, the announcement of approaching frost, and the ordering of storm signals has been enlarged, and now embraces a course of lectures by the most distinguished professors of meteorology in this country.

A course of instruction in military surveying, field sketching and topographical drawing has also been added, with a view of increasing the efficiency of signal officers in time of war.

It is my intention, in time, to have all officers of the Signal Corps instructed in meteorology, but at present it is necessary to rely in part upon the services of officers detailed from the line of the Army, who have, by long experience, become proficient in the most important duties of this service. There are officers of the line who have been connected with the service some fourteen years, to whom the service and the country owe a great deal, who, in fact, have done the greater portion of the work which makes the service a necessity, and who ought to be retained in the corps, and it is believed that Congress during the coming session will recognize the importance of retaining these officers of long experience permanently with the corps.

The study of meteorology is greatly stimulated by the work of the Signal Service, and the popular interest in this subject has induced many of the colleges to add a course of instruction in meteorology as a part of the collegiate course. At many of these colleges young men learn of the field of usefulness which the Signal Corps offers, and from this source the service has obtained many excellent recruits.

In some cases lectures have been delivered during the year by professors and enlisted men of the service. To meet the demands for text-books on meteorology growing out of the increased interest in this subject, I directed Prof. William Ferrel, Assistant, to prepare a work that would comprise the best and most useful parts of all scientific papers which have been published. This paper will be found in Appendix No. 71.

This treatise contains the most appropriate and important of the various meteorological papers of original research on the subject of meteorology, presented by more popular methods, better adapted to learners than the methods in the original papers in which it was generally supposed that the reader was familiar with what had been previously published. This valuable work when issued will meet the wants of the colleges of the country by supplying a text-book containing the most advanced researches, and it is earnestly recommended that provision be made for its immediate publication.

Prof. Cleveland Abbe, Assistant, is charged with the preparation of a treatise on the theory of instruments used in meteorology, which, when completed, will serve as a valuable text-book for those wishing to pursue the study of meteorology. Arrangements have been made for the completion of an elementary text-book intended for the use of normal and high schools. These valuable works will be completed during the current year, and the office should be provided with the necessary means for their prompt publication.

The translation of valuable papers on temperatures and storms by Ragona and Wild, are appended. For the former I am indebted to the politeness of Rev. C. M. Widman, S. J., Saint Charles College, Grand Coteau, Louisiana.

The preparation of translation of important treatises on meteorology has been made, and other translations, giving the most recent and reliable results bearing upon the science of meteorology, will be completed during the coming year.

The enlistment of young college graduates, with a view of making them observers of the Signal Service, has been continued during the year with gratifying results.

This plan of securing for the service men of education and general intelligence has now been in operation four years, and of the three hundred and nine enlistments made during that time, eighty-six were college graduates. These young men are first placed under instruction and fitted for station service, and those showing capacity for special work are selected and instructed, with a view of qualifying them for the scientific work of the service.

INDICATIONS.

The weather forecasts, based upon tri-daily telegraphic reports, have been regularly issued during the year and, as an evidence of their practical value, they now form an important item of news for the associated press of the country. In a number of cases the daily papers are furnished with special forecasts to satisfy the demands of the public, and this office has been called upon daily to furnish special predictions in the interest of commerce, agriculture, and special trades.

The most important new feature of the indication work during the year has been the large increase in special indications for particular localities. These special forecasts are made daily at 1 a. m. and 10 a. m., for the succeeding day, for the principal centres of population, for lines of railroads and States, and are sent by special message to Signal Service observers, directors of State weather services, railroad officials, and editors, for the information of the public. At the close of the year this office was sending out regularly twenty-nine of these special messages, in addition to the regular indications, as follows:

AT MIDNIGHT.

To J. F. Boyd, Chambersburg, Pa., railway signals.
To T. B. Hutchinson, York, Pa., railway signals.
To Professor Thomas, Columbus, Ohio, railway signals.
To Professor Mell, Auburn, Ala., railway signals.
To observers, Boston, Mass., and New Haven, Conn., indications for New England, to be displayed throughout that district by system of flags.
To editors of "Richmond Dispatch," "Baltimore Sun," "Washington Post," "Republican," "Journal," "Herald," "Chronicle," "Capital," and "Gazette," for those cities and vicinities.
To observers, Albany, Buffalo, Chicago, Cincinnati, Indianapolis, Louisville, Milwaukee, Saint Louis, and Toledo, for those cities and vicinities.
To observer, Jacksonville, Fla., for northern Florida.
To observer, Detroit, Mich., for Detroit and southeastern Michigan.
To R. B. Gemmell, Topeka, Kans.
To W. L. Cayle, Springfield, Mo., and observer, Leavenworth, Kans., for Kansas, Indian Territory and western Missouri.

AT 10 A. M.

To observer, Omaha, Nebr., for Omaha and vicinity.
To observer, Little Rock, Ark., for State of Arkansas.
To observers, Augusta, Ga., and Atlanta, Ga., for State of Georgia.

The number of these messages is increasing daily, and to satisfy the wants of the public it is probable that the general indications will be made for individual States and not for large districts, as they are now prepared.

The special bulletin has been issued daily, except Sundays, at 10 a. m. This bulletin contains a more general account of the meteorological conditions than it is possible to express in the limited space allotted to indications. It informs the public of approaching cold waves, storms, frosts, extreme temperatures, etc., and contains forecasts of the weather applicable to the succeeding thirty-two hours, or the following day. When practicable, the Indications Officer is required to make special weather forecasts for selected districts, at midnight, applicable to the succeeding forty-eight hours. With a view of giving the people of the Pacific Coast the full benefits to be derived from the Signal Service, special indications are now prepared for the districts on the Pacific Coast by an experienced officer stationed at San Francisco.

The following tables show the percentage of accuracy of the indications during the year. Each forecast of the several meteorological elements is carefully compared by the Indications Board with the conditions actually occurring during the time for which the forecast was made. The rules by which these percentages have been computed have been revised, and the use of ambiguous language in the indications prohibited. With these improvements, the wording of the indications, and the rigid manner of determining the accuracy of predictions, I anticipate still further improvements in the work of this division.

An increase of stations in the West and Northwest and in British America would lead to still further improvement in this important branch of the Signal Service work. The reports received from stations located on the sea-coast telegraph line are, in some cases, of special value in preparing the storm warnings, and the benefits thus derived warrant the expenditures necessary not only to maintain this line, but to extend it along the Atlantic Coast from Nantucket to Florida.

Percentages of indications verified for the year ending June 30, 1885.

Districts.	1884.						1885.						Annual averages.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
New England	78.8	84.1	78.3	88.0	86.9	81.5	87.2	83.9	86.2	81.2	79.1	88.8	82.8
Middle Atlantic States	86.2	83.5	83.9	85.8	86.5	85.2	89.4	83.9	88.8	85.6	82.9	90.9	86.0
South Atlantic States	88.8	85.7	88.4	87.2	86.3	82.8	86.1	83.2	88.5	83.1	83.2	85.8	85.8
Eastern Gulf States	88.5	85.3	86.7	87.8	84.9	81.4	89.0	84.2	87.8	83.6	87.7	88.2	85.8
Western Gulf States	90.2	84.2	86.2	86.3	87.0	80.6	85.7	84.8	86.7	84.7	87.1	87.6	85.9
Lower Lake Region	84.0	82.8	77.4	79.1	85.5	75.7	87.9	83.7	86.8	81.0	79.7	87.7	82.6
Upper Lake Region	83.7	82.2	78.0	80.5	86.2	78.9	85.5	81.9	84.0	81.0	77.6	85.8	82.1
Tennessee and Ohio Valley	85.5	82.3	84.8	81.4	88.3	78.9	85.8	82.8	86.0	86.0	84.2	87.0	84.4
Upper Mississippi Valley	84.1	85.4	78.5	78.0	85.0	77.7	84.5	83.2	84.0	85.0	83.7	87.8	83.0
Missouri Valley	78.0	76.8	72.6	78.3	79.7	75.3	80.2	74.8	78.5	82.1	80.6	88.8	78.0
Monthly averages	83.8	83.2	81.5	82.2	85.6	79.8	86.1	82.6	85.7	83.3	82.6	87.3	83.6

The indications for the districts named in the above table were for character of weather, direction of winds, and changes of atmospheric temperature and pressure.

The following table shows the percentages of verifications for the Pacific Coast regions, the predictions from July 1, 1884, to April 9, 1885, being for character of weather only, and were made at the office of the Chief Signal Officer; those made after April 9, 1885, are for character of weather, direction of wind and temperature, and were made at San Francisco, by the officer in charge of the Pacific Coast Division of the Signal Service:

Percentages of verifications for the Pacfic Coast regions for the months given.

Districts.	1884.						1885.						Annual averages.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
North Pacific Coast Region	87.1	83.9	83.3	80.5	81.2	78.2	77.7	96.0	80.4	84.2	82.3	85.3	83.3
Middle Pacific Coast Region	98.4	100.0	90.8	89.2	90.8	79.8	70.5	76.9	97.3	78.2	85.7	89.8	87.2
South Pacific Coast Region	98.4	100.0	98.3	86.7	91.7	76.6	84.8	97.2	99.1	86.6	95.0	94.4	92.5
Monthly averages	94.6	94.6	90.8	85.4	87.9	78.2	76.7	90.0	92.3	83.0	87.7	89.7	87.6

The following table shows the number of cautionary signals ordered during the year ending June 30, 1885, with the number and percentages that were justified:

Month and year.	Cautionary signals.			Cautionary off-shore signals.			Cautionary north-west signals.			Total number of signals ordered.	Total number of signals justified.	Percentage of total number of signals justified.
	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.			
1884.												
July	122	97	79.5	23	14	60.9	None.	....	.....	145	111	76.6
August	59	28	47.5	None.	......	......	None.	....	......	59	28	47.5
September	140	91	65.0	26	16	61.5	None.	....	......	166	107	64.5
October	205	149	72.2	42	33	78.6	41	20	48.8	288	202	70.1
November	200	182	91.0	91	78	85.7	None.	....	......	291	260	89.4
December	186	161	86.6	69	59	85.5	None.	....	......	255	220	86.3
1885.												
January	206	185	89.8	187	169	90.4	None.	....	......	393	354	90.1
February	160	150	93.8	77	70	90.9	None.	....	......	237	220	92.8
March	268	234	87.3	156	122	78.2	None.	....	......	424	356	84.0
April	183	149	81.4	37	29	78.4	None.	....	......	220	178	80.9
May	168	94	56.0	21	8	38.1	None.	....	......	189	102	54.0
June	135	119	88.2	62	44	71.0	None.	....	......	197	163	82.7
Total	2,032	1,639	80.7	791	642	81.2	41	20	48.8	2,864	2,301	80.3

Of the total number of cautionary off-shore signals displayed, 740, or 93.6 per cent., were justified as to direction, and 675, or 85.3 per cent., were justified as to velocity.

COLD-WAVE SIGNALS.

The following table shows the number of cold-wave signal displays, with the number and percentages justified:

Month.	Number ordered.	Number justified.	Percentage justified.	Month.	Number ordered.	Number justified.	Percentage justified.
1884—July	....	....	....	1885—February	145	129	89.0
August	....	....	....	March	80	70	87.5
September	8	2	25.0	April	76	66	86.8
October	74	57	77.0	May	33	25	75.8
November	108	106	98.1	June	....	....	....
December	176	134	76.1				
1885—January	246	226	91.9	Total	946	815	....

Of the 946 cold-wave signals displayed during the year, 815, or 86.2 per cent., were justified.

The work in this important division of the office requires special study and experience to insure the best results, and the assistants who are required to make these deductions should devote their whole time to meteorological study. The force available for the work is, however, so limited as not to admit of such assignments. The assistants who have had the most experience in the preparation of weather forecasts are officers detailed from the line of the Army, and if this service is to be maintained it should not be deprived of the services of these officers, who have shown by experience that they are competent to perform this important work.

In Appendix No. 2 will be found the rules and regulations relating to the Indications Division.

Appendix No. 3 gives the report of the officer in charge of the Pacific coast weather service.

STATIONS.

The number of stations in operation June 30, 1885, in the United States was four hundred and eighty-nine. These include the telegraph stations, printing stations, display, special river, cotton region, sunset, and eight repair stations. In addition, reports are received from twenty-five Canadian stations, by the co-operation of the Canadian Meteorological Service. Telegraphic reports are received at this office daily from one hundred and sixty stations.

During the year sixteen full reporting stations have been established and two discontinued. In addition to reports received from regular stations, three hundred and seventy-five voluntary observers and Army surgeons at fifty-two military posts have furnished monthly reports, which have been used in preparing the current publications of this office. The office has continued to co-operate with foreign observers in collecting simultaneous meteorological reports, and in this work reports have been received from three hundred and thirty-three foreign stations and five hundred and sixty-five naval and merchant marine vessels.

Reports received from the above stations have been carefully compared and tabulated for publication, and these tables contain, not only the results of observations taken during the current year, but in some cases, the means of the several meteorological elements from observations taken since the establishment of the Signal Service. The meteorological tables accompanying this report have been so arranged as to give a complete meteorological history of each station. The weather, temperature, and rainfall for each month of the current year may be readily compared with the normal weather, temperature, and rainfall, and the effect of abnormal atmospheric conditions upon agricultural products may be determined. The report of the officer in charge of the Stations Division will be found in Appendices from No. 4 to 61, inclusive.

SIGNAL SERVICE AGENCIES.

Signal Service agencies have been maintained in New York City, Philadelphia, and Boston since November, 1884, with a view of increasing the usefulness of the Signal Service to the merchant marine, to secure a greater number of meteorological observations taken at sea by merchant vessels, to insure uniformity in the methods of making the observations, and to familiarize shipmasters with the signals displayed by this service to indicate the approach of dangerous storms.

The work assigned to this new division of the office has been carried forward with gratifying results under the immediate charge of Sergt. H. J. Penrod, Signal Corps, U. S. A., whose report is given in Appendix No. 62.

TELEGRAPH DIVISION.

The regular tri-daily cipher weather reports were received during the year over the wires of the Western Union, International Ocean, Florida, Gulf Coast, and Northwestern Telegraph Companies.

One million six hundred and thirty-nine thousand cipher words of weather reports were received at, and sent from, this office during the year. Seventy thousand two hundred and twenty-five telegrams, other than weather reports, were sent and received during the same period.

On account of the reduced rates for Government telegrams, including the reports sent over circuits, the service was enabled to largely extend the dissemination of weather reports and forecasts for the benefit of the public.

SEA-COAST TELEGRAPH LINE.

This line extends along the Atlantic Coast from Smithville, N. C., to Cape Henry, Va., and from Chincoteague, Va., to Sandy Hook, N. J.; it has proved of great value to shipping, and affords a means of rapid communication when assistance may be required. Portions of this line are now used as a telephone line by the Life-Saving Service, and in cases of wreck the crews of life-saving stations are enabled to more promptly reach the scene of the wreck. The value of this line to the Signal Service and to the shipping interest of the country is such as to require not only a liberal appropriation for its maintenance, but an additional appropriation for its extension along the coast.

This service has in a single year, by means of this line, saved property the value of which exceeded the entire amount appropriated for the support of the Signal Service. A contract has been made for the manufacture and laying of the cable to connect Nantucket with the mainland, and it is expected that telegraphic communication will be established with this island during the present year, thus adding to this service a most valuable station for the display of storm signals.

UNITED STATES MILITARY TELEGRAPH LINES.

These lines have been constructed and operated by the Signal Service in unsettled portions of the country not occupied by commercial lines, and it has been the policy of this service to discontinue these lines as soon as commercial lines were constructed. The aggregated length of military telegraph lines now operated by this service is 2,779 miles, against 2,805 miles in operation at date of last report. The lines at present operated are distributed as follows:

	Miles.
Department of Dakota	893
Department of the Missouri	582
Departments of the Columbia and California	512
Department of Arizona	510
Department of Texas	197
Department of the Platte	85
Total	2,779

The accompanying map exhibits the various sections of United States military telegraph lines now in operation and those abandoned during former years.

The construction of the following new lines has been recommended by the respective department commanders, and will be included in the estimates for the next fiscal year, viz., from Fort Gaston, Cal., to the North Fork of Mad River, Cal., 28 miles; from Fort Halleck, Nev., to Halleck Station, Nev., 12 miles.

The lines have worked well, rendering valuable aid in military operations, and those in the Northwest have enabled the Signal Service to secure important meteorological reports from unsettled regions not occupied by commercial lines. I am indebted for the liberal assistance rendered by the department and post commanders for aid in the operation and repair of these lines. As these lines are operated for the benefit of the Army at large, it is recommended that legislation be secured authorizing the permanent detail of fifty enlisted men from the line of the Army for duty with these lines, and the enlisted men, while so serving, to receive extra-duty pay from the line receipts. A detailed report of the officer in charge of the military telegraph lines will be found in Appendix No. 63.

BOARDS OF TRADE.

This service has continued its co-operation with boards of trade, chambers of commerce, and other commercial organizations in the principal cities throughout the country, and the many applications received from these organizations for an increase of the information furnished by this service indicates the importance of the work. These numerous demands cannot be fully satisfied with the means at the disposal of this service, and the important interests represented by these organizations calls for a more liberal support from Congress. Many of these organizations have appointed meteorological committees, which have proved important auxiliaries to this service, as they confer with the Chief Signal Officer and give information relative to the wants of the particular industries represented, and offer suggestions as to the best means of supplying those wants. Inspecting officers consult with these committees as to the character of the work performed by the observer and obtain reliable information, which enables me to determine whether or not the duties, so far as they relate to distributing information, are properly performed. A list of boards of trade co-operating with this service will be found in Appendix No. 64.

STATE WEATHER SERVICES.

The meteorological services organized in a number of States have continued to co-operate with the Signal Service with gratifying results. The New England Meteorological Society performed excellent service in distributing the weather forecasts and special predictions for that section over railroad, telegraph, and telephone lines. The State services in Ohio and Alabama have likewise aided in distributing the special predictions of this service over the lines of railroad in those States, these predictions being telegraphed from this office to the chiefs of the weather services at midnight. Similar arrangements are now being made with the chiefs of other State services for a wider distribution of the weather forecasts of this service. A list of the States in which local State services have been formed will be found in Appendix No. 65.

MISCELLANEOUS.

COLD-WAVE SIGNALS.

There is scarcely an industry which is not more or less affected by the sudden and marked fall in temperature. This service has long appreciated the value of forecasts which would give the public information as to the approach of cold waves, but it was not until late in 1883 that a definite system was inaugurated and signals displayed giving warning of the approach of these waves. This system of warnings met with immediate favor throughout the entire country, and the press, in most emphatic terms, indorsed the effort made by the service. All branches of agriculture, extensive fruit dealers, cotton planters, officials of railroad companies, and others, expressed the greatest satisfaction with the warnings, and, in many instances, individuals have purchased flags and displayed them in towns adjacent to Signal Service stations. Railroads and telegraph companies have almost without exception co-operated with the service in distributing these warnings without expense to the Government. All means available are used by the service in giving publicity to the cold-wave warnings, that the greatest benefits possible may result from each forecast. During the present year this system has been greatly extended, the number of stations displaying the signal has been increased, but, owing to the very limited appropriation made for the Signal Service this office has only been able to furnish flags to regular stations and to pay the cost of telegraphing the warnings. An annual appropriation of five thousand dollars would enable me to extend this system of warnings over the greater part of the United States, and the benefits which would result from such warning induce me to earnestly recommend that an appropriation be made for this branch of the service. A detailed report, contained in Appendix No. 54, gives the stations at which cold-wave signals are displayed and evidence as to the practical value of these signals.

WEATHER AND TEMPERATURE SIGNALS.

A system of signal flags to indicate the changes in temperature and weather has been greatly extended during the present year. These flags are extensively displayed on lines of railroads and at railroad stations, and communicate the weather forecast made by this office to many who are unable to procure the printed indications. A full description of these signals and the extent to which they have been used is given in Appendix No. 55.

RAILWAY WEATHER BULLETINS.

The Signal Service furnishes the weather indications at a fixed hour to any railway company volunteering to transmit them over their lines without charge to the United States. This system of weather reports has proved a most valuable adjunct to the Signal Service. Many railroad companies have generously extended their aid, and the indications are daily posted at hundreds of small towns, villages, and stations throughout the country, and thus thousands of people are kept fully informed as to the probable conditions of the weather in localities where daily papers are not published. A list of railroads co-operating in this work will be found in Appendix No. 56.

FLOOD WARNINGS.

The system of river observations and flood warnings of the Signal Service has been greatly improved during the present year.

In November, 1884, special instructions were issued, in pamphlet form, for the guidance of river observers in erecting gauges, taking observations, rendering reports, etc. On January 1, 1885, the special river stations were arranged in sections and placed in charge of the Signal Service observers at section centres. These centres are usually located at some important city where the river reports in the vicinity can be most advantageously collected and published for the benefit of the river commerce. For detailed report upon this subject see Appendix No. 57.

COTTON REGION REPORTS.

The system of cotton-region reports inaugurated in 1881 has been continued, and the reports are considered of great value to the planters and to the cotton interest throughout the country. Reports of rainfall and maximum and minimum temperatures are promptly distributed daily from the districts centres, and all large cities in the South are supplied with this information. These reports are published in the newspapers and bulletins at cotton exchanges, where they are readily accessible to the business men and general public. Reports are collected and disseminated throughout the cotton region from April 1st to October 31st, each year; this year, however, owing to the small balance of the appropriation available for the purpose the observations were not commenced until May 1st. I have received numerous requests from those interested in these reports urging that they be made continuous throughout the year. These requests should be complied with, and I recommend that the appropriation for the cotton-region reports be increased from seven to twelve thousand dollars. A description of the cotton-region reports will be found in Appendix No. 58.

FROST WARNINGS.

The system of frosts warnings for the benefit of the tobacco, sugar, and fruit interests of the country has been continued during the year. Special attention has been given to the system of warnings for the cranberry interest in Wisconsin, Massachusetts, and New Jersey, and stations have been established which assure the prompt transmission of frost warnings to the threatened regions.

The railroads in the Southwest transmit by telegraph the warnings of approaching northers issued by this service. Efforts have been made to improve this service during the past year, and a cold-wave station has been established in southern Kansas for the benefit of the cattle interest in that section and in the Indian Territory.

SCIENTIFIC WORK.

STUDY DIVISION.

I am pleased to acknowledge the continued valued co-operation of the following consulting specialists in the prosecution of the scientific work of this service:

Prof. John Trowbridge, Cambridge, Mass.
Prof. H. A. Rowland, Baltimore, Md.
Prof. E. S. Pickering, Cambridge, Mass.
Prof. A. W. Wright, New Haven, Conn.

After receiving the favorable indorsement of many European meteorologists, the application of gravity correction to barometric observations was ordered, and the necessary tables were prepared for its introduction, on January 1, 1885. Improved tables for the reduction of barometric pressure to sea-level have been prepared and submitted for adoption in place of the monthly constants now in use. Before making this change it has, however, been thought advisable to refer the subject to the attention of various foreign meteorologists and national weather services, hoping thereby to bring about a greater uniformity in the practical treatment of this important matter.

The question of the proper exposure of thermometers has been carefully considered, and a report on the work thus far accomplished is ready for publication. As a practical application of the results of these investigations, much attention has been given to the locality and environment of thermometers at all Signal Service stations, and many improvements in their exposures have been made. On January 1, 1885, the time of taking all simultaneous observations of this service was advanced eight minutes, so that these observations are now taken on the even hours of standard time. This change in time was made in conformity with the recommendations of the International Prime Meridian and Time Conference, held in this city in October, 1884. The collection of data relative to tornadoes has been continued; as in past years, and a report on the tornadoes of 1884 has been published. A corps of voluntary tornado reporters send in accounts of all destructive local storms and receive in return the publications of this office bearing on this subject.

The special observation and study of thunder-storms began last year, has been carried on with valuable results. About 15,000 reports from 2,500 observers have been received. Monthly summaries of thunder-storms are compiled for insertion in the Monthly Weather Review, and a report on the thunder-storms of May, 1884, has been published as a Signal Service Note.

The compilation of a general bibliography of meteorology has been continued, and about forty-five thousand titles have been collected, twenty thousand having been added during the past year.

This catalogue will be enlarged, and the work of subject classification completed, during the coming year, thus rendering available for the work of this office an approximately complete index to meteorological literature.

The completeness of the bibliography is due, largely, to the earnest co-operation of meteorologists and librarians throughout the world, many of whom have contributed special bibliographies for their respective countries; this fact, added to its great value to all students of meteorology, renders the immediate publication of the work a matter of the highest importance.

By an arrangement with Prof. S. A. King, aeronaut, of Philadelphia, five balloon voyages have been made for the special objects of studying the distribution of temperature and moisture. The service is indebted to Professor King for doing this work without other remuneration than payment of actual expenses. The records of all his voyages, about two hundred and fifty in all, are now being examined for compilation of meteorological results.

A general report on the water supply of the Yellowstone Park has been prepared, showing that, as nearly as can be estimated, the local rain and snowfall furnishes all the water required for the observed amount of flow of geysers, discharge of rivers, and evaporation.

Prof. Cleveland Abbe, Assistant, has continued in charge of this division, and his detailed report of work performed is given in Appendix No. 66.

PHYSICAL LABORATORY DIVISION.

In January, 1885, a division known as the Physical Laboratory Division was organized. This includes the division formerly known as the Meteorological Observatory, and in addition to the custody and care of the instruments, their comparison and adjustment with standards, etc., there was assigned to it the duty of establishing and maintaining a laboratory to which all questions involving experiment may be referred, and in which improvements in methods and instruments may be tested and developed.

In this division the regular work of comparison of thermometers and barometers with the standards of the service has continued during the year. Nearly two thousand barometers have been compared, including about three hundred belonging to private individuals. About two hundred barometers have been repaired, compared, and issued to stations, besides a large number of anemometers, wind-vanes, etc.

The final determination of the standard of thermometry is only delayed by the non-arrival of a few thermometers specially made and compared at low temperatures with the Kew standards. Junior Professor Russell has completed the preparation of a paper discussing the whole question, which will be ready for publication as soon as comparison of these instruments with our own standards can be carried out.

The investigation of the question of hygrometry has been continued. For the purpose of throwing light on some very important points, Junior Professor Marvin was sent to Pike's Peak in March, with instructions to carry out a series of observations at Colorado Springs and on the summit of the mountain. The results, which are being discussed by Professor Ferrel, promise to add much to our information upon this subject.

Several methods of observing underground temperatures have been studied, and it is believed that important improvements in thermometric devices have been discovered. Arrangements are being made for observation of earth temperatures at several points during the coming year.

Studies of the electrical condition of the atmosphere have been continued at Baltimore and Cambridge, and lately at the office in Washington. A continuous photographic record has been maintained at Baltimore. It is my intention to increase the number of stations for the experimental study of this important question as soon as I can determine upon the most practicable forms of apparatus.

Among other problems which have been considered in the laboratory, in addition to the above, may be mentioned the determination of the relative sensitiveness of thermometers with spherical and cylindrical bulbs, when used wet or dry; a determination of the limits of speed necessary in the whirled wet-bulb psychrometer, and a study of the degree of accuracy with which the attached thermometer represents the mean temperature of the mercury in the barometric column.

There is a large class of meteorological phenomena that cannot be investigated by means of the data furnished by the regular observations taken at the regular Signal Service stations, and with a view of obtaining these desired data I have submitted estimates for the construction of suitable buildings and the purchase of necessary instruments for a meteorological observatory and physical laboratory at Fort Myer, Virginia. Many of the instruments necessary for such an observatory are at present in the instrument room at this office, but in the present building no suitable place can be found for mounting them. This service is greatly in need of a first-class meteorological station, where hourly observations may be made of the meteorological elements, or self-registering instruments mounted so that hourly readings of the instruments may be obtained from the records. This observatory should be located at Fort Myer, Virginia, the present school of instruction for the Signal Service, as it affords an excellent exposure for the instruments and would serve as a training school for observers of the Signal Service.

A detailed report of Prof. T. C. Mendenhall, Assistant, in charge of the Physical Laboratory Division, will be found in Appendix No. 67.

ARCTIC WORK.

During the last fiscal year Lieutenant Greely has submitted his formal report concerning the operations of the Lady Franklin Bay Expedition. He properly decided, in view of the great public interest in his work, that it was better the formal report should be submitted at the earliest possible moment without delaying it for further preparation and elaboration of the scientific appendices.

As far as his limited means would permit he carried out the scientific programme of the Hamburg International Polar Conference, and brought back with him in safety an unbroken series of meteorological, tidal, magnetical, and other observations, which cannot fail to be valuable contributions to the international scheme.

The large number of careful pendulum observations made under favorable conditions, with corresponding time observations, have been transmitted, for reduction and discussion, to the Superintendent of the United States Coast and Geodetic Survey, to whose initiative and expense these valuable observations are largely due.

Elaborate and unbroken series of tidal observations at Fort Conger, supplemented by simultaneous series at six other points in the Arctic Ocean and Robeson Channel, have been submitted to the same official, and it is hoped that through these observations the co-tidal lines of the Polar Ocean and Robeson Channel may be satisfactorily determined.

The Chief Signal Officer has also intrusted to the same department the detailed magnetical observations, which involved over one hundred and fifty thousand separate readings of instruments, for reduction and discussion.

The meteorological observations, including sea temperatures and soundings, as well as valuable observations on the velocity of sound at low temperatures, have been arranged and treated, as fully as the time would permit, by Lieutenant Greely.

Other scientific appendices have either been treated by that officer, or through his efforts have been elaborated by scientific gentlemen whom he has interested in his collections.

The lack of any appropriation for the preparation of these reports has necessarily resulted in these discussions being made gratuitously. Their hearty co-operation, thoroughly in accord with the true spirit of scientific inquiry, merits for these gentlemen the cordial thanks of this bureau.

Beyond the scientific work done in accordance with the outlined programme, the expedition further distinguished itself by supplementary work in the way of geographical discovery. It should be noted to the credit of the expedition that the scientific work was never in any manner neglected in the interest of field-work. The geographical work, considering the force employed, the lack of funds for their proper equipment, and the physical difficulties from shortness of season and the unfavorable ice conditions in such high latitudes, is probably unequalled in the annals of Arctic exploration. The extent of the work done may be best shown by the statement that it covered nearly three degrees of latitude, and above the eightieth parallel reached over one-eighth of the circle of the globe.

In the autumn of 1881, Lieutenant Greely succeeded in establishing several depots for future journeys, and in extending the work of exploration in the vicinity of his winter quarters. During the spring and summer of 1882, besides the many short trips of exploration, four important journeys were made. The first, under Doctor Pavy, attempting to discover land northward of Cape Joseph Henry, failed through the disintegration of the polar-pack, which left the party drifting for a day just south of the eighty-third parallel. Two trips of Lieutenant Greely himself, one in the spring and the other in the summer, resulted in the successful penetration and exploration of the interior of Grinnell Land. The farthest point reached in Lieutenant Greely's second trip was the summit of Mount Arthur, from which he discovered the northern portion of Grinnell Land to be covered by an ice-cap of probably six thousand square miles area, which pushes southward, in the form of glaciers, through all the valleys of two mountain ranges, named Garfield and Conger. These glacial off-shoots feed a large lake, of over three hundred square miles area and at an elevation of five hundred feet above the sea. This lake, named by Lieutenant Greely after the Chief Signal Officer, drains by a considerable river through Chandler Fiord into Lady Franklin Bay. The valleys adjoining the lake were found covered with an unusually luxuriant vegetation, which afforded sufficient pasturage for large herds of musk-oxen.

The discoveries of the ensuing year showed a large ice-cap to the south of the fertile belt of his farthest west. These explorations consequently revealed remarkable physical conditions in Grinnell Land, which have been hitherto unsuspected, *i. e.*, a series of fertile valleys extending from Robeson Channel to the western Polar Sea, hemmed in to the northward and southward by ice-caps of immense thickness, which feed glacial lakes of considerable extent, drained by rapid rivers into the Polar Ocean.

Professor Nordenskiold hoped for but failed to find similar physical conditions in Danish Greenland, nearly a thousand miles south of the point where Lieutenant Greely found them in Grinnell Land.

The most brilliant expedition of the year was that of Lieutenant Lockwood, who was charged by Lieutenant Greely with the exploration of the north coast of Greenland. Lieutenant Lockwood during an absence of sixty days, travelled with sledge nearly a thousand miles, and succeeded in reaching, with Sergeant Brainard and Eskimo Christiansen, May 13, 1882, Lockwood Island, latitude 83° 24′ N., longitude 40° 45′ W., whence he saw, fifteen miles to the northeast of his farthest land, Cape Washington, in about 83° 35′ N., 38° W.

Lieutenant Lockwood commended in the highest terms the energy and good judgment of Sergeant Brainard, and also the remarkable manner in which the supporting party, consisting of Sergeants Jewell, Ralston, Lynn, Elison, Corporal Sailor, and Private Frederick did their portion of the work.

The general results of Lieutenant Lockwood's work may be summed up, not only in the fact that he advanced the American flag to an unparalleled latitude, but that he carried Greenland over forty miles of latitude northward, and over ten degrees of longitude to the eastward of the extreme point which had ever been seen by his predecessors. He added over a hundred miles of previously unknown coast, which consists of precipitous highlands, intersected by broad deep fiords of unknown extent. Lieutenant Greely points out, as a gratifying feature, the entire freedom of the party from sickness or disaster of any kind. He further says:

* * * * * * *

In accomplishing this work Lieutenant Lockwood displayed a remarkable amount of energy, courage, and perseverance. His success, which I cannot judge as otherwise than as grateful to the country, was won only by great endurance and much physical sufferings on the part of himself and his party. I cannot do otherwise than especially invite the attention of the War Department to his work, and commend his memory to the most favorable consideration of his superiors. His labors in extending northward the limits of Greenland, and later in determining the western outlines and the interior conditions of Grinnell Land, resulted in important additions to our knowledge of the physical features of that part of the Arctic Circle. His work reached from Cape Washington, 38° W., to Arthur Land, 83° W., thus covering above the eightieth parallel one-eighth of the circle of the globe. He worthily upheld the honor of the American for courage, energy, and perseverance. If his tragic fate awakened the sympathy of the world, none the less should his successful work receive recognition. He unfortunately did not return for merited promotion.

Under similar circumstances it would have seemed grateful had my death and services been announced to the Army in general orders, and such tribute, I trust, may yet seem proper to Lieutenant Lockwood's memory.

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He also acknowledges the extraordinary energy and determination of the supporting party, and the remarkable adaptability shown by them for the work. After quoting Lieutenant Lockwood's remarks of commendation, Lieutenant Greely adds:

* * * * * * *

It is justice to add that Sergeant Brainard was, of necessity, repeatedly assigned by me, in connection with the work of the expedition, to an officer's command, and that his conduct was uniformly such as to win commendation. Apart from his valuable service in the field I believe that he possesses qualities which merit reward and which would render his promotion to the grade of second lieutenant most suitable. I heartily recommend such promotion. * * *

In 1883 Lieutenant Lockwood's attempt to further explore the Greenland coast was carried out with remarkable rapidity until he was obliged, by the disintegration of the polar-pack in the neighborhood of Cape Bryant, to return to Fort Conger.

During this trip Sergeant Brainard and Eskimo Christiansen narrowly escaped being set off in the Polar Sea by the breaking up of the pack.

Later in that year Lieutenant Lockwood, sent by Lieutenant Greely to attempt the crossing of Grinnell Land, succeeded, *via* Archer Fiord and Beatrix Bay, in striking a series of valleys which enabled him to cross the divide and strike salt water in Greely Fiord, which opens to the westward into the Polar Sea. From his farthest point Lieutenant Lockwood saw a distinct cape (Cape Lockwood), which was believed to be on a new land, which was named, after the President of the United States at that time, Arthur Land.

This highland probably consisted of the same mountains which were seen in that direction by Lieutenant Greely the preceding year, from the summit of Mount Arthur, forty-five hundred feet elevation.

The most striking result of Lieutenant Lockwood's trip was the discovery of a remarkable ice-cap which covers the interior of Grinnell Land to the southward. This ice-cap, named by Lieutenant Greely Mer de Glace Agassiz, presented for over fifty miles as a front an unbroken wall of ice averaging one hundred and fifty feet in height, broken only at two places sufficiently to permit a possible ascent. Lieutenant Greely says:

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During this journey Lieutenant Lockwood and Sergeant Brainard displayed energy, endurance, loyalty, and pluck which was hardly second to their record of the previous year on the shores of the frozen Polar Sea. For nearly a week the entire party lived on less than half rations in order to render as complete as possible their work of exploration and discovery.

Lieutenant Lockwood's loyalty in this matter impressed me with particular force. He had deemed the crossing of Grinnell Land an impossibility, and in starting out had entreated me to permit him instead to examine the glacial system of Lake Hazen, His persistency, energy, and fidelity in attempting the route from Beatrix Bay, after failing in Ella Bay, evidenced most strongly his determination that his commanding officer's idea of the practicability of the crossing of Grinnell Land should not fail through him. * * *

The brilliant geographical work of the second year was accomplished despite the recommendation of his surgeon to Lieutenant Greely that he should abandon work of that character on the ground of possible accidents. Lieutenant Greely's letter (enclosure No. 63 to his report) indicates the proper spirit on the part of an officer and soldier charged with important and dangerous work.

Provision for retreat was not neglected for geographical work. Despite the same medical objections Lieutenant Greely wisely accumulated, as early as February, a store of provisions at Cape Baird, which was later used during his retreat. These stores were supplemented later by other supplies and also by the addition of the English boat, which had been brought by Sergeant Rice and party from Thank God Harbor during April.

On the first of August the party was completely prepared for a retreat in case no vessel should reach them during the ensuing week.

The two years' work of scientific observations and geographical explorations were made successfully, without sickness or disaster, as is shown by the following extract from the report:

* * * * * * *

The condition of the party for the coming retreat was one of general strength and health, despite their arduous labors of two years amid unequalled cold and darkness. Of the seven hundred and twenty-one days spent at Fort Conger, two hundred and sixty-eight days had been marked by the total absence of the sun. On two hundred and sixty-two days one or more sledge parties had been absent in the field, on journeys entailing from two to sixty days' absence, and some three thousand miles have been traveled by such parties. An unequalled latitude to the north had been attained, to Greenland over a hundred miles of new coast had been added, and to the westward Grinnell Land had been crossed, its interior surveyed, its physical geography determined, and the contours of its northern half fixed with considerable certainty. This geographical work had been done without disaster, without physical injury to any one, and for its prosecution no part of the scientific work for which the expedition was formed had been neglected or abandoned.

The programme of observations had been carried out as fully as instruments and circumstances would permit, and during the two years there had, on an average, been made and recorded daily fully five hundred observations. * * *

In accordance with his instructions, Fort Conger was formally abandoned on the 9th of August, the earliest moment at which Archer Fiord could be crossed. The attempt, even at that early date, nearly caused the destruction of the launch. By indomitable energy the party, in twenty days' time, with their boats reached Cape Hawks, at the southern extremity of Dobbin Bay, in sight of Cape Sabine. They had been delayed by fog, violent gales, densely packed floes, and at one point were four days embayed by new ice. Their boats were almost hourly in danger of destruction, and serious nips were of frequent occurrence.

Of the Cape Hawks depot taken up by him, Lieutenant Greely says:

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The depot consisted of three hundred and forty-two pounds of stearine, one hundred and sixty-eight pounds of preserved potatoes, about six gallons of rum, and some two hundred and fifty pounds of bread. Fully nine-tenths of the bread had spoiled since our previous visit, and, owing to the grave uncertainty of the future, the entire amount was carefully examined for such as was serviceable, and a considerable quantity of that taken was so mouldy that it was barely eatable. In connection with subsequent events it may, perhaps, be properly stated that not exceeding a hundred pounds more of bread could possibly have been selected from the unserviceable amount left, and all of this was permeated and covered by a slimy, green mould, which rendered the bread unfit for any one, and eatable only by a starving man.

To supplement our small amount of coal, then reduced to about four hundred pounds, all the casks at Cape Hawks were broken up and taken on the launch, to be used for steaming purposes.

We left Cape Hawks at 4.25 p. m. and ran southwest nearly an hour, finding the old ice increasing in amount and in places cemented thickly together with young ice. My judgment at the time of the situation is best shown by a literal quotation from my journal of that date: "I cannot but feel that we are now in a critical situation, not knowing what can be depended on. Since no vessel reached this point in 1882 and 1883 (to this time), we must all feel an uncertainty as to the party for our relief being at Life-boat Cove."

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On August 28th the boats were beset in attempting to reach Victoria Head from Cape Hawks.

On September 10th Lieutenant Greely, abandoning his launch and one boat, endeavored to reach Cocked Hat Island, about eleven miles distant. Severe gales on two occasions, when they were almost within reach of shore, drove them into the middle of Kane Sea, and only after thirty days' exposure on the moving pack did they succeed in reaching land at Eskimo Point, in Baird Inlet.

The journal of Lieutenant Lockwood confirms fully the statement that Lieutenant Greely persisted in his purpose to reach the Greenland coast from the drifting ice-pack, despite the unanimous opinion of his officers and men to the contrary, and that he attempted to reach the Ellesmere coast only when the action of the elements had made such course the only practical one. Had he been able to carry out his plans he would have reached the Cape York natives, where he could have wintered. I had expected Lieutenant Greely would succeed in doing this, and in it was my hope for his safety. In this particular only, and by no fault of the party, has it failed me in any of my expectations.

The retreat by boats from Fort Conger to Cape Sabine may well be called the most remarkable boat journey of the age, and well justifies the encomiums passed on it by a high English authority on Arctic ice navigation, as a journey demanding unusual powers of executive ability and as evidencing remarkable capacity for command. The route along the coast was three hundred miles in length, but the tortuous course followed, necessitated by the ice-conditions, entailed over five hundred miles' travelling. This journey was made through straits and seas filled with ice of remarkably heavy character, the navigation of which is always most dangerous, and frequently destructive. It is evident that such a journey could only be made by a combination of prudent and daring measures, by the result of which the commander must stand or fall. Whatever inexperienced critics may characterize as errors, it none the less follows that Lieutenant Greely brought in health and strength his entire party, and in safety all the records and important scientific instruments connected with his two years' work, to the appointed place at Cape Sabine, and, but for the rashness with which the "Proteus" was forced into the ice, the entire party would have returned in health.

Lieutenant Greely outlines the condition of affairs during the retreat, and at the time of landing, as follows:

* * * * * * *

The general conduct of the party during the exhausting labor necessary in constructing stone huts, as well as during our dangerous drift on the ice-pack, was exceedingly creditable. It was but natural that great physical sufferings, from lack of proper shelter, continued excessive work, and insufficient food, should react on the mind, and cause murmurs and discontent, which at times broke into indiscreet remarks and reflections. This impropriety was only on the part of a few members, and as detailed in the attached journals of Lieutenant Lockwood (written in shorthand at the time) and Sergeant Brainard. Fortunately the party, as a whole, was never otherwise than subordinate and united. That subordination had been our safety in our four hundred miles travel, which had ended in the party of twenty-five landing in health and strength, with records and instruments safe, on the barren coast of Ellesmere Land.

This courage, good behavior, and loyalty may theoretically seem a matter of course in the common interest, which could be subserved only by unity and harmony, but when death, starvation, and great physical suffering impend, the temptation for the strong to appropriate all and sacrifice the weak is certainly very great. * * *

The preservation and successful transportation of his records and instruments to Cape Sabine resulted from Lieutenant Greely's forethought and systematic arrangement of them to this end. His strong determination to save these doubtless had some effect in producing a corresponding spirit in the men, as evidenced by their unanimous action regarding the abandonment of the pendulum. Lieutenant Greely says:

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The pendulum being a heavy and cumbersome instrument, I informed the men that while the saving of it was much to be desired from the value of subsequent comparative observations, yet it could not weigh against the chances of any man's life, and that whenever any one thought his life endangered by hauling it, or any one insisted on its abandonment I would do so. To the credit of the party no man ever hinted at the abandonment, and most of them were outspoken for its retention to the last. * * *

Pending report of men sent out to learn the condition of affairs at Cape Sabine, winter quarters were erected at Eskimo Point.

As Lieutenant Greely had abandoned one boat on September 12th, in deference to the unanimous recommendation of his officers and men, but one boat remained, preventing any movement until he learned, on October 9th, that three other boats were within his reach on the same coast. There is no desire on the part of the Chief Signal Officer to enter into any detailed discussion of certain phases connected with this expedition which have engaged the public attention, and unfortunately assumed in some measure a form of controversy.

Lieutenant Greely's report is confined entirely to facts which were within his knowledge while at Cape Sabine, and he carefully avoids committing himself to any theory as to the line of conduct which should have been followed by Lieutenant Garlington or others.

The facts in this report speak for themselves, and, limited as they are to a plain statement as to the condition of affairs and the effect produced by them on his future action, need no elaborate treatment or comment.

The following extracts from his report covers the condition of affairs at Cape Sabine, as developed on his arrival there:

* * * * * * *

The 9th of October was an eventful day to the party; Sergeant Rice returned bringing us news. He brought the record of Lieutenant Garlington, dated July 24th (Appendix No. 116), which informed us of the sinking of the "Proteus" on the 24th, and that Lieutenant Garlington and her crew had gone to the east coast to communicate with U. S. S. "Yantic," or a Swedish steamer. Rice discovered three caches; the English one of two hundred and forty rations; the Beebe cache of two hundred and forty rations; aggregating four hundred and eighty rations; and the wreck cache, which, from Lieutenant Garlington's report, contained five hundred rations of bread, sleeping-bags, tea, and a lot of canned goods. The record further said: "Cache on Littleton Island and boat at Cape Isabella." The words "two hundred and fifty rations" contained in Lieutenant Garlington's copy as furnished to the court of inquiry, was not in the original record.

The modification of Lieutenant Garlington's record is referred to, as the record left had an important bearing on my subsequent actions. The record informed me of the disaster to the "Proteus," and Lieutenant Garlington's positive assurance that "everything within the power of man to rescue my party would be done."

His declaration that he left for the east coast to endeavor to open up communication and pointed out that if the "Yantic" failed him a Swedish vessel was possible, were construed as conveying to me in the strongest terms his fixed determination to return to Cape Sabine if either steamer was fallen in with, and I could look to him for relief.

Two courses were open to me. One to proceed to Cape Sabine, await possible assistance thus promised, and, if it did not come, to cross to Littleton Island by sledge as soon as the channel should close.

Those who are inexperienced in the varying phases of Arctic ice-conditions cannot clearly understand why Smith Sound crossed in whale-boats during July should be impossible for similar boats in October. In July, with its ever-present sun, Smith Sound is generally an open sea free from ice, but in October, 1883 it was filled with floes and ground-up ice, continually driven about by heavy tides and severe storms, while the scant six-hour sun of October 10th disappeared entirely for the winter only sixteen days later.

Our experience of the previous thirty days had shown the impossibility of crossing the upper part of Smith Sound, owing not only to the large quantities of heavy ice moving southward, but particularly on account of the prevalence of rubble and slush-ice, among which young ice was continually forming, which would neither permit the passage of a boat nor bear the weight of a man.

Our experience had been somewhat similar to those of naval expeditions under like conditions. The drift party of the "Polaris" had been unable, in that channel and in sight of that very spot, to make land but a few miles distant; failing, says the official narrative, "despite the most persistent efforts." On the east coast of Greenland the crew of the "Hansa," in January, 1870, had been unable to reach shore but two miles distant, although their lives appeared to depend on their success.

Two months before, to a day, a powerful vessel of the Navy had been forced out of the lower and less dangerous portion of this sound, owing to the dangers of its navigation.

By extraordinary exertions and fortunate circumstances we had been able to make land twelve miles off, without sacrificing, as did one of these parties, their entire scientific collection.

In consequence of this condition of affairs, a movement to Cape Sabine meant a permanent camp until relief could come by vessel that fall, or the straits freezing over to permit crossing by sledge. The second course was to turn our faces homeward, and taking the second boat at Cape Isabella, push southward to Clarence Head along the west coast, and from that point attempt the Cary Islands, where we would be safe, or, the ice-conditions precluding that course, in desperate strait, push still southward in the hopes of being able to cross Jones and Lancaster Sounds and reach Pond Inlet.

Smith Sound, from Isabella southward, opens like a fan, so that, necessarily, the ice spreading in early fall leaves large water-spaces, which freeze over at a very late date, if at all. During our stay at Eskimo Point, the ice had frequently opened up so that a voyage could have been made by boat to the southward, and by ship across Smith Sound to the eastern shore. As far north as Cape Isabella, Smith Sound was navigable for ships most of the time until after November 4th. In short, the ice was a pack, changing with every wind and tide, which was fringed with young and slush-ice, though in general not of a heavy character.

The prevailing sentiment of the party plainly favored a movement to Cape Sabine, where all possible help was pledged, and I decided on my own responsibility to move to that point, reluctantly turning my back to the southern trip, which might have involved the entire destruction of the party or have secured its ultimate safety.

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This report of facts confirms the opinion already put forth by the Chief Signal Officer in his statement to the Proteus Court of Inquiry, that the record left at Sabine, holding out promises of assistance, had an important, if not disastrous, effect upon Lieutenant Greely's subsequent action, since these promises were not fulfilled, but led to a false security. It also confirms the soundness of the Chief Signal Officer's judgment in recommending an autumn expedition in 1883. The terms of Lieutenant Greely's report show that Smith Sound, as far northward as Cape Isabella, was navigable into the early days of November.

It is further clearly shown why Smith Sound could not be crossed by Lieutenant Greely, and what has been overlooked by many is pointed out, that he had four boats within reach in the neighborhood of Cape Sabine.

As regards the small depot at Isabella, extraordinary exertions were made to secure it, and it was brought in November to the middle of Baird Inlet, where it was abandoned to save the life of a frost-bitten member of the party, Sergeant Elison, who later died from injuries received in that journey. A similar attempt the ensuing April resulted in the death of Sergeant Rice.

The whole report shows a remarkable husbanding of strength, food, and fuel, which had important results in preserving the lives of the survivors.

The spirit of courage, subordination, and discipline which prevailed at Sabine among the party, was doubtless due to Lieutenant Greely's programme of systematic living, amusement, and occupation. That he was ever mindful of the scientific character of the expedition is shown by the following extract:

* * * * * * *

On the 4th of November regular barometer observations were commenced, from a barometer abandoned by Lieutenant Garlington at Cape Sabine, and these observations were made every four hours from 7 a. m. to 7 p. m., until the instrument was broken, about three weeks before the final rescue of the party. Gaps in the record necessarily occurred towards the latter part of the time, owing to the diminishing strength and deaths of the observers. During the winter months of total darkness the thermometer was rarely read, except at 11 a. m., as I was unwilling to subject any member of the party to unnecessary exposure, even in the scientific interest of the expedition.

* * * * * * *

The last temperature and weather observations were made forty hours before the rescue.

The fact that the centre of Smith Sound remained open the entire winter prevented any crossing by sledge to the eastern coast, but an attempt was made to communicate, which resulted as follows:

* * * * * * *

On February 6th Sergeant Rice and Jens returned about 2 p. m., well, but thoroughly exhausted, especially the Eskimo. Sergeant Rice reported that open water extended from ten miles off Wade Point and a mile off Brevoort Island, as far north into Kane Sea as the eye could reach. At no time was the Greenland shore visible. There was much moving ice, with dense water-clouds along the edge of the fast ice. He thought he reached a point as far south as Littleton Island, and about ten miles distant. The two men suffered very much, as may be supposed, the temperature being from —18° to —36°, with one severe storm. * * *

Late in March Lieutenant Greely, in hopes of obtaining game from Alexandra Harbor, some twenty-five miles westward of Camp Clay, sent Private Long and an Eskimo to that point. A thorough search showed that no game had wintered there that season.

During this trip Private Long reached a point which enabled him to extend the southern part of Hayes Sound some twenty miles further to the westward than ever before known. With a view to this work, Lieutenant Greely had carefully instructed Private Long before the trip, in order that such journey might not be fruitless in contributing to the object for which the expedition was planned. The spirit which animated the expedition in regard to scientific work is shown by the following extract:

* * * * * * *

The variability of spirits and the indomitable courage of the party were evidenced by Sergeants Brainard, Jewell, and Israel volunteering to go into Hayes Sound for geographical explorations in May in case Long succeeded in obtaining game, and later the doctor added his name. I had talked much of sending a party into that sound in May for the purpose of exploration, more to encourage the men than for any other purpose, and such discourse and planning appeared to have borne good fruit. * * *.

During the autumn several small seals were obtained, in March nearly a hundred pounds of birds, and in April a young bear. This meat, together with about twelve hundred pounds of shrimps and sea-weed (largely obtained by Sergeant Brainard) and the addition of the seal-skin clothing, saxifrage, and such roche de tripe lichens as could be gathered, supplemented their food supply.

One death from disease occurred in January, followed by many deaths of starvation in May, which, checked by the capture of the bear, commenced again the middle of May, and continued to the end.

Where the facts in the case have made it incumbent on Lieutenant Greely to mention breaches of discipline and misbehavior on the part of any member, the moderate and impartial tone taken by him cannot but be remarked. When the sense of official duty has not required expression, he has spoken kindly or not at all, but has left all unimportant matters to be described in the journals of Lieutenant Lockwood and Sergeant Brainard, as he well says, "by a dead and by a living witness."

In connection with the last year, Lieutenant Greely says:

* * * * * * *

> In regard to the general conduct of the expedition during the year after leaving Fort Conger, any impartial critic must speak of it in terms of commendation. Courage, patience, and fortitude characterized all, both living and dead. If, in a few cases, impatient spirits gave expression to indiscreet and insubordinate utterances, yet such feelings vented themselves in words, without demoralizing the party or weakening the bonds of discipline which united us as a whole.
>
> As to cases where men were guilty of appropriation of the food of others to themselves, I bear in mind now, as then, the great temptation which slowly starving men must experience when food is within their reach. The spirit of conciliation and forbearance which I so long exercised while such a policy seemed possible without fatal results, was followed by the execution of Private Henry, which the exigency of the case demanded. I attach herewith, as appropriate appendices, the orders in the case, as well as a previous report to the honorable the Secretary of War, and his reply approving my course in the matter. (*See* Appendices 128, 131, 132, and 133.) It was only after repeated thefts that this terrible retribution fell upon Henry. The execution was regarded by me simply in the light of a self-defense for the remnant of my party and myself. While deeming the punishment merited, I appreciated fully the tremendous temptation it was to a man like Henry (who was, as he acknowledged himself, devoid of moral principles) to take that which was before him, and which would, in a measure, satisfy him physically.
>
> As to other matters which have engaged an undue share of public attention, while having no official knowledge of the facts in the case, yet the responsibility for action in connection with such an expedition rightfully and properly rests upon the commanding officer.
>
> In assuming the responsibility in that connection, I know of no law, either human or divine, which was broken, and so do not feel called on as an officer or a man to dwell longer on such a painful topic.
>
> In Appendix No. 134 will be found the dates and causes of death of the various members of the expedition.
>
> I should be unjust to the dead, whose arduous labors, heroic endurance, and unflinching determination advanced the national ensign into an unparalleled latitude, carried out the programme of international scientific observations, increased perhaps in an unequalled degree in this century our knowledge of the physical characteristics and configurations of polar lands, and who, more than all, in the most remarkable boat journey of the age, brought safely, at the price of great bodily suffering and diminished chances of life, through a dense polar-pack, these records to a point whence they would eventually reach the world. They died for that end, and should not be forgotten.
>
> It would be equally unjust not to mention the services of the living. The lack of precedent forbade the War Department from confirming appointments and promotions made by me in the exigencies of my position. The necessity of maintaining the dignity of the service likewise interfered to their detriment when public interest was in a way of rewarding them with moderate fortunes.
>
> Two of these men, Hospital Steward Henry Biederbick and Sergeant J. R. Frederick, have been discharged the service on surgeon's certificate of disability; and in a maimed condition are adventuring the gain of their livelihood. The three remaining are now members of the Signal Service, on application of the Chief Signal Officer. As a reward in some way commensurate with the successful work done by them, and the extraordinary suffering entailed through no fault of their own, I respectfully recommend that their Arctic services may be considered as rendering all these men eligible for appointment to the retired list of the Army, as of the grades of signal sergeants and hospital stewards.

* * * * * * *

Regarding Lieutenant Greely, the Chief Signal Officer trusts that proper recognition may be taken of his services by renewal and passage of the bill reported favorably at the last session of Congress with a view to his becoming assistant to the Chief Signal Officer. A good war record, wounds, and twenty-four years' honorable service (seventeen in connection with this corps), apart from his remarkable Arctic service, entitles him to this consideration. His present physical condition precludes active cavalry service, and, under present prospects, relieved by law from signal duty, he would go, after a quarter of a century's service, to the retired list, a lieutenant. His loss would be a misfortune to the Signal Corps, with which he has distinguished himself, and to the successful organization and perfection of which he has materially contributed. The experience of the past year emphasizes the importance of a field officer as assistant to the Chief Signal Officer. Under present arrangements any absence of the Chief Signal Officer results in the administration of the bureau by the Disbursing Officer, who necessarily supervises and authorizes his own disbursements. The debt still due both the dead and the living of the International Polar Expedition, led by Lieutenant Greely, which so perfectly performed all its work, it is believed the country is anxious and ready to meet, and it is hoped that no question as to the faults of others, and for which they are not responsible, may prevent so just a purpose. Fitting recognition is due the memory of Lieutenant Lockwood, who so heroically carried the ensign of his country further into the mysteries of the North than any other was ever carried. Promotion to Lieutenant Greely and Sergeant Brainard, whose pathetic stories are now ready for the world, and whose records of efficiency, courage, and generosity are all that highest manhood could make them, should be quick and fitting, while the four remaining survivors should be put upon the list of public servants whose accomplished work entitles them to public support.

Lieutenant Ray, having completed the work for which he was detailed, promptly asked to return to his regiment. An officer of the line, without special training for the delicate duties imposed, Lieutenant Ray executed his trust with great fidelity and efficiency, showing throughout the best qualities of a gentleman and soldier.

APPROPRIATIONS.

The limited appropriation for the support of this service during the last fiscal year left it in a crippled condition, and I have not been able to fully meet the demands for special reports and weather forecasts from the various sections of the country. The service has been maintained and good result secured, but it has been impossible to carry on the full work of this bureau, while a slight increase in the appropriation would have enabled me to more fully disseminate the information collected at this office, thus securing greater benefits to the people.

The number of stations for the display of cautionary signals on the lakes should be increased to meet the demands of those interested in lake navigation, and the necessary funds supplied, which will enable me to keep these stations open at night. The cotton-region reports should be made continuous, but the meagreness of the appropriation for this branch of the service prevented me from commencing this system of report before May 1st.

The appropriation laws of the last three fiscal years were framed under the expressed wish of Congress to separate the appropriation for this service from those made for the support of the Army. From its organization until recently, the Signal Service has been provided for as a part of the Army. The military duties of the corps are strictly performed, the battalion is organized and under drill, and ready for the performance of its proper duties in time of war.

The meteorological work performed by the Signal Service had its origin and development in the War Department, and, besides being by that right a part of it, it is the most valuable feature of Army work in time of peace, and it is now recommended that while the items of appropriation for the service remain separate and specific, they be made as a part of the appropriation for the Army.

Referring to the appropriations for the fiscal year ending June 30, 1886, I desire to call especial attention to the fact that the estimates submitted have been prepared with great care, and cover only the absolute needs of this service which experience has demonstrated should be provided for, if it is the intention of Congress to maintain the work of this bureau on an efficient basis. If such is not the intention, then the appropriation of anything is wasteful. The people demand an equivalent return for their money, and by inadequate and ambiguous appropriation laws, resulting in a crippled condition, the Signal Service has been unable to satisfy the wants of the agricultural, commercial, and general interests of the country. No other bureau or department of the Government is so hampered by provisos as is this, and as the various branches of work of the service are inseparably connected one with the other, and all contingent upon ample appropriations, it follows, that, while in some items the amounts asked have been given, yet the omission to appropriate in some other item has resulted in the failure of both, as one could not be utilized without the assistance of the other.

The appropriation for fuel is not sufficient for our stations, many of which, in the extreme northwest country, require fires nearly the entire year, and in those latitudes the cost of fuel is proportionately high; the officers of the corps, and those doing duty therewith, have been allowed (as are all officers of the Army), by paragraph 1851, Army Regulations, to purchase fuel at a fixed rate, the Government paying the difference, but by the insufficiency of the appropriation for the fiscal year 1885 this privilege has been denied to them for a portion of the time, and by the failure to insert the necessary proviso in the appropriation acts for 1886 they have been entirely deprived of this legal privilege, thus enacting an unjust discrimination against the officers of this corps and those doing duty therewith.

The estimate for maps and bulletins should be favorably considered, and the amount asked be appropriated, for it is this appropriation which furnishes the means by which the investigations of this service are presented to the public, and a cutting off of any portion of the amount estimated for will entail not only embarrassment but oftentimes complete failure in the dissemination of such information as the public demands from this service.

The total amount of the deficiencies for the fiscal year ending June 30, 1886, is $396,167, of which $300,000 are for the purchase of a site and the erection thereon of a fire-proof building for offices suitable for the uses of the Signal Service, and it is especially urged that this particular item may receive favorable consideration, as well, of course, as all others.

It is also respectfully suggested that the Secretary of War recommend the addition of the following clause, viz: "And except such sums (not to exceed $3,000) and except such services as the Secretary of War may, in his judgment, deem necessary for the best interests of all concerned," to the proviso in the Army bill which prohibits the use of any money appropriated for other parts of the Army by or for the Signal Corps.

Statement of amounts appropriated for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1885.

Legislative, executive, and judicial:	
Regular clerks, messengers, &c	$10,660 00
Scientific experts, clerks, &c	45,000 00
Postage stamps, postal union countries, allotted by Secretary of War	1,080 00
Stationery allotted by Secretary of War	3,583 34
Rent of buildings for Signal Office	7,000 00
Contingent expenses allotted by the Secretary of War	7,017 49
Total	74,340 83
Sundry civil expenses:	
Observation and report of storms—	
Manufacture, purchase, and repair of instruments	$5,500 00
Telegraphing reports	136,000 00
Expenses storm signals	10,000 00
Cotton-belt reports	7,000 00
Connection life-saving stations	5,500 00
Instrument shelters	2,000 00
Rents, &c., of offices outside of Washington	40,000 00
River and flood reports	10,000 00
Maps and bulletins	25,000 00
Total	241,000 00
Maintenance and repair of military telegraph lines	$24,000 00
Stations on Nantucket Island	40,000 00
Pay, &c., of the Signal Corps:	
Pay of officers	$30,500 00
Pay of enlisted men	200,000 00
Mileage to officers	5,000 00
Pay of contract surgeons	1,200 00
Commutation of quarters to officers	8,208 00
Cost of telegrams	250 00
Total	245,158 00
Subsistence Department:	
Subsistence and commutation of rations, Signal Corps	$155,000 00
Total	155,000 00
Quartermaster's Department:	
Regular supplies—	
Fuel	$6,200 00
Commutation of fuel, at $9.00 per month	23,760 00
Commutation of fuel, at $8.00 per month	23,328 00
Forage for mules and horses	3,100 00
Stationery	100 00
Stoves, and repairs to heating apparatus	600 00
Lights	300 00
Straw for animals	217 00
Straw for bedding	46 08
Total	57,651 08

Sundry civil expenses—Continued.	
Incidental expenses—	
Horse and mule shoes	$500 00
Blacksmith's and other tools	400 00
Veterinary supplies	300 00
Fire apparatus, disinfectants, &c	200 00
Office furniture, Fort Myer	100 00
Total	1,500 00
Interment of officers and men	$200 00
Apprehension of deserters	120 00
Transportation—	
Materials and funds	$25,000 00
Officers and men	8,875 00
Means of, mules	1,000 00
Means of, harness	130 00
Means of, repairs to	500 00
Total	35,505 00
Barracks and quarters—	
Commutation of quarters	$84,108 00
Work and supplies at Fort Myer	1,500 00
Work and supplies on hospital	300 00
Total	85,908 00
Clothing, camp, and garrison equipage—	
Six wall tents, &c	$415 00
Issues in kind	4,900 00
Total	5,315 00
Medical Department:	
Medical attendance and medicines, officers and men, Signal Corps	$5,000 00
Medical attendance and medicines, officers with Signal Corps	100 00
Medical and hospital supplies, Fort Myer	700 00
Medicines from depots, &c	1,000 00
Material, repairs to hospital, Fort Myer	200 00
Total	7,000 00
Printing and binding allotted by the Secretary of War, about	$40,000 00
Support of the Army:	
Expenses Signal Service, U. S. Army	$5,000 00
Grand total	1,017,698 71

Many private persons, institutions of learning, etc., purchase their instruments through this office, because of the advantage afforded to obtain greater accuracy, by having the instruments compared with our standards, for which no extra charge is made. Of these there have been purchased two hundred and ninety-three instruments at a total cost of $1,775.30.

PROPERTY AND DISBURSEMENTS.

The improved methods of administering the duties of the Property and Disbursing Division of this office have continued, with gratifying results, and the accounts passed the scrutiny of the accounting officer of the Treasury with few suspensions, and these have been for mere technical informality. All vouchers are paid by checks drawn to order, and in no case to bearer; this mode being considered the safest, not only in transmitting money, but it also furnishes the assurance that the money reaches the person for whom it is intended. All requisitions are carefully scrutinized, before payment, by an officer other than the Property and Disbursing Officer. The methods of verifying and settling accounts in this bureau are those prescribed by Army Regulations, and are identical with those which govern in the Quartermaster's Department of the Army, with the additional check that these accounts pass the scrutiny of the Examining Division of this office before they are submitted to the accounting officer of the Treasury.

The service has been economically managed, and the additional care of the property, which is widely distributed over the country, has greatly increased the work of the division. Under the present rule, each article purchased is taken up on a property report, which is rendered quarterly for transmission to the Third Auditor of the Treasury, so that there is not one article, from the merest trifle to the most expensive instrument that is purchased, but what is carefully reported to the accounting officer of the Treasury.

The experience of the past year furnishes additional reasons for renewing my recommendation for the erection of a fire-proof building for offices suitable for the uses of the Signal Service, as per plans and estimates contained in Senate Executive Document No. 152, 48th Congress, 1st session. The buildings now occupied by this service are insecure and unsafe for the storage of valuable Government property.

The annual report of Capt. S. M. Mills, Fifth Artillery, Property and Disbursing Officer, for the year ending June 30, 1885, will be found in Appendix No. 68, and the report of the Examining Officer for the same period is given in Appendix No. 69.

PUBLICATIONS.

The Monthly Weather Review of the Signal Service has been regularly published during the year, and with improvements and additions it now forms one of the most valuable productions of this Service. Each Review contains a general summary of the meteorological data collected by this office during the month. The introduction gives a brief statement of the weather conditions throughout the country, and the probable effect of the same upon the agricultural products of each section. The monthly means of temperature and rainfall, compared with the normal temperature and average rainfall for each district, are published in tabular form. Similar tables referring specially to the cotton region are given, based upon cotton-region reports. These tables are increasing in value from year to year, as they afford means of comparison between the meteorological conditions and their probable effect upon the crop.

A large number of marine reports are received in time to be utilized in tracing storms from the continent over the north Atlantic, and the probable tracks of these storms are given on the monthly charts accompanying the Review, thus affording information specially valuable to shipmasters.

The Monthly Summary and Review of International Meteorological Observations contains a summary of the reports published in the International Bulletin, and a general discussion of the meteorological conditions prevailing over the northern hemisphere. These observations have been published since 1873, and they furnish a valuable collection of data for the solution of the great problem of meteorology. With a view to economy I have discontinued the publication of the bulletin and substituted a large daily chart, upon which the data is presented in graphic form.

The annual report of the officer in charge of the Fact and International Bulletin Division, in which these publications are prepared, will be found in Appendix No. 64.

Work has been continued on the publication known as the Meteorological Record, and by special authority of the Secretary of War arrangements have been made for the issue of this important work for a single year.

This publication contains a revised edition of the tri-daily bulletins and charts of this service, and affords a meteorological record of especial value in the study of storm movements within the United States. It is the most complete work now issued, and it is recommended that some provision be made for its regular publication.

The following Professional Papers of the Signal Service have been published during the year:

XIV. Charts of Relative Storm Frequency for a Portion of the Northern Hemisphere.—J. P. Finley, 2d Lieutenant, Signal Corps.

XV. Researches on Solar Heat and its Absorption by the Earth's Atmosphere.—Prof. S. P. Langley.

XVI. Toronado Studies for 1884.—J. P. Finley, 2d Lieutenant, Signal Corps.

The following Signal Service Notes have been published during the year:

XIII. The Relation between Magnetic Storms and Northers at Havana, Cuba.—G. E. Curtis, Sergeant, Signal Corps.

XIV. Physical Observations on Board the Lady Franklin Bay Expedition of 1883.—W. H. Lamar, jr., and F. W. Ellis, Sergeants, Signal Corps.

XV. River Floods and Danger Lines of 1882.—Prof. H. A. Hazen.

XVI. The Effects of Wind Currents on Rainfall.—G. E. Curtis, Sergeant, Signal Corps.

XVII. A First Report upon Observations of Atmospheric Electricity at Baltimore, Maryland.—Park Morrill, Private, Signal Corps.

XVIII. The Aurora in its Relation to Meteorology.—A. McAdie, Private, Signal Corps.

XIX. Report on the Tornado of August 28, 1884, near Huron, Dakota.—S. W. Glenn, Sergeant, Signal Corps.

XX. Report on Thunder-storms of May, 1884.—Prof. H. A. Hazen.

These publications are based upon the data collected by this office, and contain results which bear directly upon the current work of the service. It is therefore recommended that some provision be made for the continued publication of papers of this character.

Appendix No. 70 contains the report of the officer in charge of the Publications Division.

PERSONNEL.

The general work of the service is performed by twenty-one officers, three professors, three junior professors, five hundred enlisted men, and fourteen civilian clerks. Under the provisions of an act of Congress approved July 7, 1884, limiting the number of officers to be detailed from the line of the Army as acting signal officers, Lieutenants Caziarc, Ward, and Maus were relieved by S. O. No. 166, dated July 17, 1884, 2d Lieutenant B. M. Purssell, Signal Corps, U. S. A., was assigned to duty July 19th, relieving Lieutenant Caziarc, as officer in charge of Correspondence and Records Division; his report as officer in charge of this division will be found in Appendix No. 64. 2d Lieutenant F. M. M. Beall, Signal Corps, U. S. A., was assigned to duty July 19th, relieving Lieutenant F. K. Ward, in charge of Stations Division.

Under the provisions of an act of Congress approved March 3, 1885, limiting the number of officers to be detailed from the line of the Army as acting signal officers, Lieutenant James Allen, an indication officer, was relieved from duty and ordered to his regiment by S. O. No. 142, dated June 23, 1885; Captain S. M. Mills and Lieutenant P. H. Ray were relieved from duty as acting signal officers, at their own request, on June 30th and June 20th, respectively.

Captain F. B. Jones, A. Q. M., was detailed by the Secretary of War as acting signal officer, and relieved Captain S. M. Mills of his duties as Property and Disbursing Officer of the Signal Service, July 1, 1885.

Sergeants James Mitchell and Frank W. Ellis were promoted to be 2d Lieutenants in the Signal Corps, to date August 15, 1885, after having passed a successful competitive examination.

The enlisted men of the service were distributed as follows: one hundred and sixty-two at the office of the Chief Signal Officer (since reduced to one hundred and fifty, and will be still further reduced); on telegraph lines, ninety-seven; at Fort Myer, thirty-three; and at Signal Service stations, two hundred and two, leaving six vacancies.

ORGANIZATION OF THE SIGNAL CORPS.

A completed organization for the Signal Corps is of the greatest importance. By retaining the experience of officers who have served for long periods in this service great economies can be secured each year, serious mistakes can be avoided, and excellence of service can be obtained in no other way.

The entire subject of reorganization of the Signal Corps is now in the hands of a joint commission of Congress that has thoroughly investigated it, and their report may be looked for at the meeting of Congress. This commission, with great patience, gave the fullest opportunity for the presentation of the views of the Chief Signal Officer, and he reasonably expects such recommendations to Congress as will result in permanence and great advantage to the service, in which he hopes for the concurrence and aid of the Honorable Secretary of War. The following extracts from the record of testimony before the commission show the need and kind of organization necessary, and wherein it is now deficient:

* * * * * * *

A FIXED ORGANIZATION.

The necessity of a fixed organization is the same as in any other military body. Without it the loss of experience by instructed officers leaving the service is a constant source of weakness, and loss in money as well as experience.

The saving of money where well-matured experience is applied in the disbursement of large sums (a million dollars a year in the Signal Service) bears about the same relation to its disbursements, when done by temporary details, as the building of a house with inexperienced mechanics does to building it with thoroughly trained men who know their business.

The saving by the legislation I have recommended, that is, by giving a permanent corps, would many times pay the cost of salaries, and in discipline and organization it is absolutely necessary. Now, when an officer is derelict and discipline becomes necessary, he asks to join his regiment, which is granted, and he is not only lost to my service, but an example of my want of power to enforce discipline is shown to those who remain.

The want of such a corps is felt every day and it is hoped that Congress will no longer withhold its benefits, leaving it alone, of all services in the Army, weakened and embarrassed by the want of organization. This is one of the ways in which economy and efficiency can be secured by legislation, and the other, as refers to economy, is to build an office for the Signal Service, and the saving in rents will be greater than the value of the money it will cost.

A military organization is required because, to do our work, the military habit is necessary, that is, unquestioned obedience, promptness, and accurate methods of work. We must have this, and the military method is the only means ever devised by which this can be accomplished.

By other methods obedience and promptness are not so certain, and while we might get it in the majority of cases, yet there would be times when the continuity of our work would be destroyed by want of promptness, or disobedience of orders. When exact work is required, depending upon the absolute direction of others, it has been the custom of the world always to employ the military plan, and no other has ever been found so competent.

The Articles of War and Regulations of the Army add both to the vigor and efficiency of the Signal Service, and it is that fact alone which enables us to always be sure of getting prompt reports, enabling us to make our predictions in minutes, where the civil bureaus of Europe take hours, giving our bureau a prominence over all others.

These reasons of time, and the use of delicate instruments, require training and long practice, and especially the absolute dependence on specific time apply in such force to no civil, and no other military, bureau.

The necessity for grades of rank in every military organization has been recognized from time beyond record. It is the prime condition of their wholesome existence. These grades are all there is for the ambition of military men to look ahead to, it corresponds to the regular forward steps men look for in all walks of life; and without increased rank with age, a permanent military organization would have within it the conditions of its own infirmity and inferiority, and no good man would remain in it; at present, there is no promotion provided.

Our meteorological work all depends upon an accurate and continuous record. Without both of these conditions the work is valueless. To get these conditions, observers must be carefully trained, and must be held with an absolute control. This makes a military organization indispensable.

The gathering of these series is traditionally military work, and all that is of much value has been done under some form of military organization. Our own is the first in extent and value, and was begun about 1820, by the Medical Department of the Army. It has been kept up ever since, and fifty-two of the post hospitals still report to us, and give us valuable reports. The next in value is by the English ordnance. Then comes those of the religious orders, the monasteries, and they have what corresponds to a military control of the strictest kind, which has enabled them to secure unbroken series. But our own, by the Signal Service, in the past fifteen years, is unique, and of many times the value of all the other series combined.

There can be no doubt that there will be a loss of efficiency by a transfer. Efficiency is now as high as can be reasonably expected, and any change can but lower it, while to transfer the work will practically destroy the corps, as only its work, and not the men, can be transferred, leaving its future, at best, an experiment of very uncertain success.

The rules governing it are the development of fifteen years, are of a purely military nature, and will not suit a civilian organization. In fact, very much that we have done in the way of organization and plan, which has cost all these years of labor and money, and which has given such eminent satisfaction everywhere, will be lost. The country is satisfied and there is no call for its transfer.

* * * * * * *

The work is now done much more economically than it could be by a civil organization. It is a well-known fact that, except in the highest grades, military wages the world over are less than any other, and especially less than in the civil public service.

This is due largely, especially in republics, to a fixedness of service and removal from personal and political fluctuations.

We now pay $65 and $100 a month, when a like grade of men in civil employment, and who are less educated, receive $100 and $150. The latter figures would certainly rule in a civil service.

The chiefs of our offices in large cities are now most efficient, and do the work as sergeants, with the pay of, say, $1,200 a year. Under civil service rule these places would certainly be magnified to correspond with chiefs of the other public offices by which the Signal Office is surrounded, until the pay would be three or four times as great as now.

The work of the men at Signal Service stations extends through seventeen hours of the twenty-four. This, while in the military service, counts as no extra time, and the men sleep between hours; in the civil service, under the law, it will count for more than two days, resulting finally in the employment of two men to do the work now done by one. These are the sources of additional cost that can be foreseen, and there is no doubt but finally the cost of doing the same work now done, and which certainly will be continued, will cost double what it now does.

By the CHAIRMAN:

Q. This goes on through the entire year?

A. For three hundred and sixty-five days, Sundays and holidays. I do not know that this has come to the attention of the commission, but it is a very important factor.

There is no doubt but these two legal days, more than sixteen hours, would be, under a civil organization, a legal claim.

LEGISLATION NEEDED BY THE SIGNAL SERVICE.

To be added to the Signal Corps, with rank and pay of officers of like grade of cavalry—

1. One colonel.
2. One lieutenant-colonel.
3. One major and disbursing officer.
4. Eight captains; and the second lieutenants of the Signal Corps, after eight years of service as second lieutenants, may be appointed by the President first lieutenants; and after fourteen years' service as lieutenants, may be appointed by the President captains. And the one hundred and fifty sergeants of the Signal Corps shall be composed of three classes: twenty-five of the first class, who shall have the pay proper of $50 a month; fifty of the second class, who shall have the pay proper of $40 a month; and seventy-five of the third class, who shall have the pay proper of $34 a month, the same as now. And all the sergeants, corporals, and privates of the first class shall be known as "Observers of the Signal Service."

I am, sir, very respectfully, your obedient servant,

W. B. HAZEN,
Brig. and Bvt. Maj. Gen'l,
Chief Signal Officer, U. S. Army.

Hon. WILLIAM C. ENDICOTT,
Secretary of War.

LIST OF APPENDICES ACCOMPANYING THE REPORT OF THE CHIEF SIGNAL OFFICER OF THE ARMY FOR THE YEAR ENDING JUNE 30, 1885.

1.—Fort Myer, report of officer in charge.

2.—Rules and regulations of the Indications Room.

3.—Report of the officer in charge of the Pacific Coast Division of the Signal Service.

4.—Summary of the work performed in the Stations Division.

5.—Table showing the mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, U. S. Army, for each month and the year, with monthly constants for the reduction to sea-level of barometric observations made at Signal Service stations. Compiled from January, 1880, to December, 1884, inclusive, except at stations opened subsequent to the former date. Obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) normals by 3.

6.—Table showing the mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, U. S. Army, for each month of the year. Compiled from the commencement of observations at each station to, and including, December 31, 1881.

7.—Table showing the mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, U. S. Army, for each month of the year. Compiled from the commencement of observations at each station to, and including, December 31, 1884.

8.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each, to and including July, 1872. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.

9.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from September, 1872, to, and including, October, 1879, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3.

10.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date. The daily means are those obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.

11.—Table showing the mean monthly temperature and departure of 1884 therefrom in degrees (Fahr.) at selected stations of the Signal Service, U. S. Army. This normal has been computed for the decade ending December 31, 1884. The daily means are obtained by dividing the sum of the three observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.

NOTE.—Observations from January 1, 1875, to November 1, 1879, taken at 7.35 a. m., 4.35 and 11 p. m. (Washington time), and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).

12.—Table showing the annual and mean annual temperatures at stations of the Signal Service, U. S. Army. The daily means are obtained by dividing the sum of the three telegraphic observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month; the annual, by dividing the sum of the monthly by 12.

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).

13.—Table showing the mean daily range of temperature at stations of the Signal Service, U. S. Army, for each month of the year 1884. The daily range is the difference between the highest and lowest temperatures, as recorded on self-registering thermometers; the mean daily is obtained by dividing the sum of the daily by the number of days in the month.

14.—Table showing the highest temperature, and year in which it occurred, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each, to, and including, December, 1884, from self-registering thermometers.

15.—Table showing the lowest temperature, and year in which it occurred, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations to, and including, December, 1884, from self-registering thermometers.

16.—Table showing the monthly and annual mean temperatures from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884. The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.

17.—Table showing the monthly maximum and minimum temperatures, and annual range of temperature, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884, from self-registering thermometers.

18.—Table showing the monthly and annual mean temperatures at military post hospitals for the year ending December 31, 1884. The daily mean is obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.

19.—Table showing the monthly maximum and minimum temperatures, and annual range of temperature at military post hospitals, for the year ending December 31, 1884, from self-registering thermometers.

20.—Table showing the monthly and annual mean temperatures at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending December 31, 1884. The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by 2; the monthly, by dividing the sum of the daily by the number of days in the month.

21.—Table showing the monthly maximum and minimum temperatures at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending December 31, 1884, from self-registering thermometers.

22.—Table showing the mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, U. S. Army, for the months of July to October, 1884, and May and June, 1885. These means are obtained by dividing the sums of the daily readings of self-registering thermometers by the number of observations taken—one daily at 5 p. m. (central time).

23.—Table showing the mean temperature at 7 a. m., 3 and 11 p. m. (Washington time) at stations of the Signal Service, U. S. Army, for each month of the year. Computed from January 1, 1880, to December 31, 1884.

24.—Table showing the mean a. m., p. m., and midnight temperatures at stations of the Signal Service, U. S. Army, for each month of the year. Computed from the commencement of observations to December 31, 1884.

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).

25.—Table showing the average temperature of the surface of the ocean at stations of the Signal Service, U. S. Army, on the Atlantic and Gulf coasts, for each month and the year. Computed from observations taken at 2 p. m. (Washington time), daily, from the date observations began to December 31, 1884.

26.—Table showing the mean temperature and average precipitation, the latter in inches and hundredths, at stations of the Signal Service, U. S. Army, for each season of the year. Computed from the commencement of observations at each to, and including, December, 1884. The mean temperature is deduced from three telegraphic observations taken at the same moment of Washington time at all stations. The seasons comprise the following months: Spring—March, April, and May. Summer—June, July, and August. Autumn—September, October, November. Winter—December, January, and February.

NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).

27.—Table showing the normal precipitation and departure (of 1884) therefrom, in inches and hundredths, at stations of the Signal Service, U. S. Army, for each month of the year. The normal has been computed from the commencement of observations to December, 1884, inclusive.

28.—Table showing the average precipitation, in inches and hundredths, at selected stations of the Signal Service, U. S. Army, for each month and the year. Computed for the decade ending December 31, 1884.

29.—Table showing the average precipitation, in inches and hundredths, at selected stations of the Signal Service, U. S. Army, for each month and the year. Computed from January, 1880, to, and including, December, 1884.

30.—Table showing the annual and mean annual precipitation, in inches and hundredths, at stations of the Signal Service, U. S. Army. Compiled from the commencement of observations to 1884, inclusive.

31.—Table showing the monthly and annual precipitation, in inches and hundredths, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884.

32.—Table showing the monthly and annual precipitation, in inches and hundredths, at military post hospitals, for the year ending December 31, 1884.

33.—Table showing the monthly and annual precipitation, in inches and hundredths, at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1884. (Copied from the records on file at the office of the chief engineer, C. P. R. R.)

34.—Table showing the precipitation, in inches and hundredths, at the cotton-region stations of the Signal Service, U. S. Army, for the months of July to October, 1884, inclusive, and May and June, 1885.

35.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each to, and including, July, 1872. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3.

36.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from September, 1872, to, and including, October, 1879, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3.

37.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.

38.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the 7 a. m., 3 and 11 p. m. (Washington time) observations, and from January 1, 1882, to December 31, 1884.

39.—Table showing the average dew-point at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from January, 1882, to, and including, December, 1884. The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.

40.—Table showing the date of the first light frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884–'85.

41.—Tables showing the dates of the first killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for each winter from 1873–'74 to the winter of 1884–'85, inclusive.

42.—Table showing the date of the last light frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884–'85.

43.—Table showing the date of the last killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for each winter from the commencement of observations to, and including, the winter of 1884–'85.

44.—Table showing the date of the first snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884–'85.

45.—Table showing the date of the last snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884–'85.

46.—Table showing the average movement of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884.

47.—Table showing the average hourly velocity of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each to, and including, December, 1884. The average hourly velocity is obtained by dividing the average monthly movement by the number of days in the month, and the result by 24.

48.—Table showing the average cloudiness (scale of 0 to 10) at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884, from the three telegraphic observations. The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.

49.—Table showing the average number of clear, fair, and cloudy days at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884, from the three telegraphic observations. Cloudiness is recorded on a scale of 0 to 10, each observation. Clear days comprise from 0 to 8 tenths; fair, 9 to 22; and cloudy, 23 to 30.
50.—Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, during each month of the year 1884. (Copied from the records on file at the office of the chief engineer, C. P. R. R.)
51.—Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, U. S. Army, during each month of the year. Computed from the commencement of observations at each to, and including, December, 1884.
52.—Annual meteorological summaries (Forms 127 B) at stations of the Signal Service, U. S. Army.
53.—Description of the various districts shown on the Signal Service district map.
54.—Report of the display of cold-wave signals.
55.—Report upon the temperature and weather signals.
56.—Railway weather bulletin service.
57.—River reports and flood warnings.
58.—System of cotton-region reports.
59.—Classified list of stations of the Signal Service.
60.—Report of the display of cautionary signals at special stations.
61.—List of stations of the first and second order, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed.
62.—Signal Service agencies.
63.—Report of officer in charge of telegraph lines.
64.—Report of officer in charge of Correspondence and Records Division.
65.—Report of officer in charge of Fact and International Bulletin Division.
66.—Report of assistant in charge of the Study Room Division.
67.—Report of assistant in charge of Physical Laboratory.
68.—Report of the Property and Disbursing Officer.
69.—Report of officer in charge of Examiner's Division.
70.—Report of officer in charge of Publications Division.
71.—Meteorological Researches, Prof. William Ferrel.

APPENDIX 1.

REPORT OF OFFICER IN CHARGE OF FORT MYER.

FORT MYER, VIRGINIA, *July* 10, 1885.

GENERAL: I have the honor to submit my annual report of the school of instruction and post of Fort Myer for the fiscal year ending June 30, 1885.

The course of instruction as prescribed for officers and enlisted men has been closely followed.

Five officers of the Signal Corps reported during the year for instruction, namely, Lieuts. Frank Greene, J. H. Weber, J. P. Finley, J. E. Maxfield, and F. R. Day. Lieutenant Weber was relieved from duty November 8, 1884, without completing his course, and granted sick leave. The remaining four officers completed the full course and passed the final examination.

Lieutenants Walshe, Finley, and Day were ordered on inspection duty February 27, 1885, and returned to duty at this post on the following dates: Lieutenant Finley, May 20, Lieutenant Day, May 31, and Lieutenant Walshe, June 2.

Lieutenant Day was relieved from duty at this post June 1, 1885, and ordered to report at the office of the Chief Signal Officer.

At the commencement of the fiscal year, July 1, 1884, there were 13 enlisted men under instruction; of this number, 2 (privates Flynn and Frazee) were discharged for misconduct, 1 (Private Hill) deserted, and 1 (Private Brown) failed on final examination and was discharged. The remainder completed the full course and passed.

Thirty-nine enlisted men reported for instruction during the year; of this number 31 completed the full prescribed course and passed, 2 (Privates Davis and Sues) failed on final examination, 5 (Privates Laughlin, Wyman, Welch, Hoffman, and Chapman) were discharged before completion of course on account of incompetency, and 1 (Private Keenan) died of consumption.

Lieutenants Greene, Walshe, and Maxfield have assisted in the instruction department during the year. The prescribed course of lectures for enlisted men were delivered by Lieutenant Maxfield.

Instruction in military signaling by flag and torch, heliograph, homographic and international code, and in electricity and practical telegraphy, was given during the year to officers and enlisted men. A ten days' course in Mendall's military surveying was given to the class of officers, which consisted of rough sketches taken in the field.

Owing to the want of horses for the proper equipment of the field telegraph train, all drills and instruction in the use of this important feature of the corps in time of war could not be carried on. It is hoped that the time is not far distant when this matter will receive from Congress the consideration it deserves, that the necessary means may be provided which will enable the Chief Signal Officer to keep pace with other countries in this method of communicating with the different commanders of the army while in battle.

POST ADMINISTRATION.

Improvements of the post have been carried on during the year as mapped out by the Chief Signal Officer, and the results have been highly satisfactory, the most important being the grading and graveling of the road from the cemetery to the Aqueduct bridge, guttering with cobble-stone, trimming out and grubbing along the roadsides. A gravel walk has been put down leading to the laundress' quarters, a new road opened in rear of the quartermaster's storehouse, and the grounds on the north and west of this building have have been graded, top dressed, and ready for grass seed in the fall.

The saw-mill, an unsightly building, standing near the west end of the quartermaster's storehouse, has been moved to a more suitable place. A great amount of grubbing and cleaning up has been done during the year in the field inclosed with the wire fence. The woods lying south of the post, and extending to the cemetery wall, is now being cleared up by grubbing, leaving a clear view of the city and Arlington Heights.

Water-closets, with ample sewerage, have been constructed at the hospital, instruction building, and laundress' quarters, and adds greatly to the sanitary condition of the post. The old privies, with wood troughs, heretofore in use, have been torn down. A good system of surface drainage has been put down for draining the cellars of the officers' quarters and the stables and corral yard.

As the improvements inaugurated by the Chief Signal Officer have progressed the numerous mud-holes heretofore visible have been entirely obliterated. A thorough police of the post has been rigidly maintained, and its sanitary condition is good. Orders of the Chief Signal Officer require a weekly inspection of the post by the medical officer, with a view of ascertaining its sanitary condition, and all recommendations of this officer are promptly carried out.

The old and defective water-closets in the officers' quarters have been replaced by the Demorest patent with flushing tanks. This insures an ample supply of water, and thoroughly flushes the closets and soil pipes. This was impossible while the old style of closets was kept in use in these buildings. The bad odors and gases heretofore so noticeable have now been obviated.

The full quota of men for the permanent party has been obtained and comprises a good steady working force. The non-commissioned officers have well performed all duties assigned them. It is hoped steps may be taken to insure extra-duty pay for the mechanics and laborers of this force, which they so much need and deserve.

I am, general, very respectfully, your obedient servant,

JAMES A. SWIFT,
Second Lieutenant Signal Corps, U. S. Army, in charge.

To the CHIEF SIGNAL OFFICER, U. S. A.,
Washington, D. C.

APPENDIX 2.

RULES AND REGULATIONS OF THE INDICATIONS ROOM.

INSTRUCTIONS }
No. 22. }

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, April 22, 1885.

I. Paragraphs 100 to 222*b*, inclusive, Office Regulations, 1883, are annulled.

II. The following compendium of rules and regulations relating to the indications division is published for the information and guidance of those concerned.

1. The indications officer will have charge of the division for the preparation of synopses and indications, which will be designated as the indications division; he will carefully scrutinize the charts and latest reports, and call the especial attention of the indications board to all meteorological conditions requiring attention under the regulations; and will at all times keep himself informed of all regulations referring to indications.

A.—*For the guidance of the officer in charge.*

2. He will be at the office at 9 a. m., 12 m., 5 p. m., and 12 midnight each day.

3. He will examine the reports carefully to discover telegraphic errors; note all such errors and call upon the telegraph division for corrections when they are necessary and can be obtained.

4. He is strictly required to draw his own isobars and isotherms upon the weather chart (No. 1) used in preparing the synopsis and indications.

5. He will verify or correct the manifold copy of the synopsis and indications, seeing that the text is clear and legible, and will attach his name to it. He will also see, so far as it may be in his power, that they are given the widest publication where they are useful. He will take such efficient steps as will insure the speediest delivery of the indications, bulletins, and charts to the press and post-office, and his responsibility and duties will only end when this is done. (Ins. 69, 1884.)

6. A single copy of the synopsis for the a. m. report will be sent to the publications division by 9.26 a. m., the complete synopsis and indications not later than 9.49 a. m., the morning special bulletin at 9.52 a. m., and the indications for the midnight report at 12.45 a. m. (Ins. 140, 1884.)

7. He will call for special telegraphic observations to be taken at such stations, and at such times as he may consider necessary. When river reports are to be discontinued he will notify the officer in charge of the stations division, who will issue the necessary orders. (Ins. 74, 1884.)

8. For the morning weather chart he will make tracings of the isobars, isotherms, and storm-tracks from the original charts of the 7 a. m. report as soon as practicable, preferably before the completion of the indications. These tracings will be sent to the lithographing room by or before 9.26 a. m., daily. He will give close attention to the morning weather chart until it has been actually completed, seeing that all through its several stages the work is correctly done and leaving no chance for errors. For this purpose he will visit the printing room, and inspect the chart when it is first struck off, and verify it before allowing the edition to be printed. (Ins. 140, 1884.)

9. He will compare each tri-daily indications of the previous day with the conditions exhibited in the three succeeding weather charts.

10. He will particularly notice, in connection with the study of charts, the rain and dry-wind charts, the charts and tables of normal temperatures and normal barometric pressures and the barometric oscillations for the several stations, the charts exhibiting average direction of translation of low barometers (storm-tracks), the Monthly Weather Review and its charts, and the file of tri-daily charts and prevailing wind-directions. These charts should be examined in reference to the corresponding month of preceding years, and to the months preceding and succeeding. Particular attention should be given to the study of the cloud areas and of dew-points as affecting probable changes of night temperature.

11. On the day of assignment to duty in charge of the indications division he will carefully examine all instructions pertaining to that division.

12. He will see that the mounted messenger is present, with horse saddled, at the moment the indications are ready, and that he starts immediately at a rapid pace; and failing in this, in any particular, he will report the fact in writing. (G. O. 28, 1873; Ins. 29, 1876.)

13. A messenger will report to him each morning at 9 o'clock in the indications room, and continue under his orders until after the completion of the morning duties. (Ins. 192, 1881.)

14. As without sleep in the daytime, the fatigue caused by this duty is too great to permit its best discharge, officers on that duty are recommended to sleep in the afternoon. (Cir. 5, 1874.)

15. Officers on duty in the indications division are excused, during the time of their tour, from the continuous night-watch, as noted in paragraph 3, page 80, General Regulations, 1885, but may be required to remain at the office to announce the progress of storms or other facts connected with their especial duty when such announcements are needed. (Ins. 14, 1878.)

16. Before taking charge of indications division, the officer assigned will report to the Chief Signal Officer for instructions. (Ins. 13, 1884.)

17. Form 434 (check-slip for indications officer) will be carefully examined by the indications officer at each report, and as each item of the report is completed it will be successively checked. The check-slips will be sent with the record book of the indications board to the Chief Signal Officer before 12 m. daily, except Sunday. (Ins. 69, 1884.)

18. Action upon telegrams requesting special weather indications will be taken at once by the officer in charge of the indications division. (Ins. 111, 1884.)

PRESS REPORTS.

19. In preparing press reports (Form 109*a*) when the indications are completed for any district, its name in the margin of the report will be checked with a cross (thus +). When the indications are intentionally omitted for any district its name will be checked with a zero (thus 0).

20. For the press dispatch, the officer in charge will endeavor to get out the morning synopsis and indications at 9.49 a. m.; the special bulletin at 9.52 a. m., and the midnight indications at 12.45 a. m. (Ins. 140, 1884.)

21. One file of the manifold press reports will be kept in the division.

22. The list of addresses for the distribution of the press reports and special bulletins will be posted in the indications division and kept corrected to date. (L. R. 6679, Mis., 1884.)

CHARTS.

23. The following designation is adopted for indications-division charts, and will be written in blue pencil on the right-hand lower corner of each leaf, in each monthly book of tri-daily charts together with the name of the officer in charge of indications, and the date and number of the tri-daily chart. The 7 a. m., 3 p. m., and 11 p. m. charts being numbered "i," "ii," and "iii," respectively: Chart 1, weather; Chart 2, barometric changes; Chart 3, barometric departures and abnormal variations; Chart 4, temperature changes; Chart 5, temperature departures and abnermal variations; Chart 6, clouds; Chart 7, dew-points. (Ins. 53, 1881.)

24. In the preparation of these charts, pencils of different colors, as prescribed, will be used. When not otherwise stated, the ordinary black lead pencil is intended. If possible, all lines traced on these charts will be extended across the continent.

25. Charts 1 to 6, inclusive, for May 1, 1881, and Chart 7, for July 1, 1881, will be followed as models. No change will be made in any of these charts without the written authority of the Chief Signal Officer. (Ins. 53, 1881.)

26. Each officer in turning over the charge of the indications division to his successor will see that the charts are completed to the date of relief. (Ins. 40, 1877.)

27. All telegraphic reports received by mail on account of being delayed at stations or at transfer offices, from any cause, will, as soon as they arrive, be translated and entered on the indications charts. (Ins. 16, 1884.)

28. On all charts, data received too late for use in current indications will be entered in blue; in such instances, the amount of precipitation, if any, will be underscored in red.

29. Chart corrections to reports will be given in blue by the side of the corresponding erroneous data, through which a blue line will be traced.

CHART NO. 1.

30. Chart 1 will show for each station: (1) temperature; (2) barometer (reduced to sea-level); (3) wind velocity, and when reported, the maximum velocity since last regular report; (4) amount of rainfall (or melted snow); (5) state of weather; (6) wind direction; (7) ocean swell at certain sea-coast stations.

31. Isotherms, with their proper figures, will be drawn in blue for each ten degrees of temperature, in full lines; when doubtful, in broken lines.

32. Isobars, with their figures, will be drawn in red for each tenth of an inch of atmospheric pressure, in full lines; when doubtful, in broken lines. The words "high" or "low" will be so placed as to show the relative barometric condition of the regions marked.

33. The wind velocity will be entered as received, in miles per hour if registered; if estimated, by writing "calm," "light," "high," &c., as the case may be. Maximum wind velocities, when reported, will be entered in parenthesis to the right of the current velocity.

34. The amount of precipitation for the eight hours preceding the report, if any, will be entered in inches, tenths, and hundredths, underscored in blue; if inappreciable, a short horizontal line will be drawn, underscored by a similar line in blue. The absence of precipitation will be shown by the figures 00.

35. The direction of the wind will be shown by an arrow, flying with the wind, drawn through the center of the station circle.

36. The state of the weather at the time of the report will be shown thus: Cloudy or fair by circles fully or one-half shaded; heavy rain by "R."; light rain by "r."; heavy show by "S."; light snow by "s."; threatening by "T."; clearing by "C."; foggy by "f."; hazy by "z."; smoky by "sm."; sleeting by "slt."; written within the circle. A thunder-storm will be indicated by a short horizontal line in red, within and at the bottom of the circle. Frost will be written in full near the circle and will be underscored in red, prefixed by "K." or "L." to denote killing or light, respectively.

37. The ocean swell from sea-coast stations will show the direction from which it comes and its character as heavy or light, thus: Heavy northeast swell by writing by the side of the station, "Hy. NE.," or light south, thus: "Lt. S."

38. The appropriate data from river and other stations not reporting tri-daily will be entered, and on the margin of the 3 p. m. chart the 11 a. m. reports from stations specially called for, noting also the hour of observation.

39. The absence of data for temperature, barometer, wind velocity, weather, and sea swell will be shown by a short horizontal line in the space specified for the data itself.

40. The absence of data for precipitation will be shown by writing in its place "blk." Such absences will also be noted on the margin of the chart.

41. Data of doubtful accuracy will be questioned thus "?", and by a note on the margin of the chart; marginal notes will always be in blue.

42. When a station is reported as missing, the fact will be indicated by drawing a short blue line within the circle.

CHART NO. 2.

43. Chart 2, barometric changes, requires the following definitions of the terms used:

An actual barometer is the barometer reading corrected for temperature and instrumental error only.

A reduced barometer is the barometer reading corrected for temperature, instrumental error, and gravity, and reduced to sea-level.

A normal barometer is the mean of actual barometers.

A barometric departure is the difference between the mean barometer for the month and hour of the report and the barometer for a given report.

Abnormal variations in barometer are changes different from the mean hourly changes.

44. On Chart 2 enter within the circle the reduced barometer from regular stations throughout the United States and the actual barometer from Canadian stations for current report; above the barometer and within the circle enter the difference between the current barometer and that of the previous report, prefixed by the sign + if the current reading be higher, and the sign —, if lower. In a similar manner enter the difference between the current barometer and that of the previous twenty-four hours, with proper sign prefixed, within the circle and below the current barometer.

45. Lines in blue will show each tenth of an inch of change in barometer during the past eight hours, with the amount of change in figures, with the sign + to show a rise, and the sign — to show a fall.

46. In a similar way lines in red will be drawn to show each tenth of an inch of change in pressure in twenty-four hours, with corresponding signs and figures.

47. There will also be drawn in blue and red, of double weight, lines to show no change in barometer for eight and for twenty-four hours, respectively, with the sign + and —, each on its appropriate side.

48. A list of corrections will be prepared to be applied to the barometer reports of the first day of each month, so as to exhibit the true changes in actual barometer; these corrections, with proper algebraic signs prefixed, will be written without the circle, and will be applied to the eight and twenty-four hour changes of first report and to the twenty-four hour changes of second and third reports.

CHART No. 3.

49. In connection with Chart 3, barometric departures and abnormal variations, are prepared three auxiliary charts, to show for each station the mean barometer for each tri-daily telegraphic report of the current month; this mean barometer is obtained by adding to the normal barometer for the month and hour of report the monthly constant. The frequency of the wind-direction for the month (including calms) at the several stations, will be shown on these auxiliary charts by arrows flying with the wind, not more than three directions being given. The order of relative frequency will be shown by blue, red, and yellow arrows, respectively. The prevalence of calms will be indicated by drawing a circumference around the circle of station of the proper color, to show the order of relative frequency; also on these auxiliary charts isobars will be drawn in red to show each tenth of inch of mean reduced pressure as determined for each of the tri-daily reports of the month. At the end of the month these charts will be pasted in the back of the book.

50. On Chart 3 enter within the circle for each station the current departure, which is the difference between the current barometer and the mean barometer for the month and hour of report, as entered on the auxiliary charts above referred to. This departure is affected by the sign + if the current barometer be higher than the mean barometer, and with the sign — if it be lower.

51. Compare each departure with the departure of the same station for preceding report, place the difference without the circle, and, if practicable, immediately to the right. This difference, which is the abnormal barometric variation, has the sign + if the current departure is algebraically greater than the preceding, and the sign — if less.

52. Lines in carbon will be drawn to show each tenth of an inch of departure, the amount of such departure in figures, with proper sign prefixed.

53. A carbon line of double weight will show the mean pressure, *i. e.*, be drawn between the + and — departures, with the signs + and —, each on its appropriate side.

54. Lines in blue will be drawn to show each tenth of an inch of abnormal variation in barometer during past eight hours, with amount of change in figures, with the sign + to denote an abnormal increase, and the sign — to denote an abnormal decrease of pressure.

55. A line in blue, of double weight, will show where the variation is normal, *i. e.*, be drawn between the + and — variations, with the signs + and —, each on its appropriate side.

56. On this chart will also be entered the direction of the wind as explained for Chart 1.

CHART No. 4.

57. Chart 4, temperature changes, requires the following definitions:

Actual temperature is the temperature observed, corrected for instrumental error only.

A normal temperature is the mean of actual temperatures.

A temperature departure is the difference between the normal temperature and the actual temperature for a given report.

Abnormal variations in temperature are changes different from the mean hourly changes.

58. On Chart 4, enter within the circle the actual temperature of the current report; above the actual temperature, and within the circle, enter the difference between the current actual temperature and that of the previous report, prefixed by the sign + if the current reading be higher, and the sign — if lower. In a similar manner the difference between the current temperature and that of the report twenty-four hours previous will be entered, with the proper sign prefixed, within the circle and below the actual temperature.

59. Lines in blue will be drawn to show each ten degrees change in temperature during the past eight hours, with the amount of changes in figures, with the sign + to denote a rise, and the sign — a fall.

60. Similar lines in red will be drawn to show each ten degrees of change in temperature during the past twenty-four hours, with figures and signs.

61. There will also be drawn, in blue and red, respectively, lines of double weight to show lines of no change in temperature for eight and twenty-four hours, with the signs + and —, each on its appropriate side.

CHART No. 5.

62. In connection with Chart 5, temperature departures and abnormal variations, three auxiliary charts are used, which show for each station the normal temperature for each tri-daily telegraphic report for the current month. Isotherms will be drawn

on these charts in blue, to show each ten degrees of normal temperature. At the end of the month, these charts will be pasted in the back of the book.

63 On Chart 5 enter within the circle for each station the current departure, *i. e.*, the difference between the current actual temperature and the normal temperature for the month and hour of report, as shown on the auxiliary charts.

64. This departure is prefixed by the sign + if the current actual temperature be higher than the normal, and with the sign —, if lower.

65. Compare each departure with the departure of the same station for the preceding report, place the difference without the circle, and, if practicable, immediately to the right.

66. This difference, which is the abnormal variation in temperature, has the sign + when the current departure is algebraically greater than the preceding, and the sign — when less.

67. Lines in carbon will be traced to show each ten degrees of departure, with the value in figures, and the proper sign prefixed.

68. A carbon line of double weight will show the normal temperatures, *i. e.*, be drawn between the + and — departures, with the signs + and — each on its appropriate side.

69. In a similar manner, lines in blue will be drawn, to show each five degrees of abnormal variation of temperature during the past eight hours, with figures, and the sign + to show an abnormal rise, or the sign — to show an abnormal fall in temperature.

70. A blue line of double weight will be drawn through points of no variation, with the signs + and — each on its appropriate side.

CHART No. 6.

71. On Chart 6 show by the Signal Service cloud symbols the cloud conditions prevailing over the country: For the upper clouds, red, placed above the circle; for the lower clouds, blue, placed below the circle.

72. The area of complete cloudiness will be inclosed by a green line and marked $\frac{4}{4}$.

73. The direction of movement of the clouds will be shown by an arrow of the color used for the clouds.

74. The stations at which precipitation has fallen since the previous report, and is not falling at the time of report, will be marked within, or near the circle, by a blue cross, thus ×. The cross will be omitted from stations from which clouds are not required to be sent.

75. Dense haze or smoke will be shown, respectively, by writing within or near the circle "Z" or "SM," and light haze or smoke by "z" or "sm," in red or blue, as the conditions belong to upper or lower clouds.

76. Dense fog will be shown by writing, in blue, "F," within or near the circle, and light fog by "f."

77. On the 7 a. m. chart, will be entered within the circle, the minimum temperature.

78. Isotherms in blue will be drawn, for each ten degrees of minimum temperature, as explained in Chart 1.

79. Temperatures will be compared with temperatures of the same stations for the preceding day, and the difference, prefixed by the signs + or —, to show respectively a rise or fall, will be placed immediately without the circle, and, if practicable, to the right.

80. A line of double weight in red will be traced between the + and — differences to indicate no change in minimum temperature in one day, with the signs + and —, each on its appropriate side.

81. From May 1 to September 30, on the 3 p. m. chart, will be entered within the circle, the maximum temperature. Isotherms in blue will show each ten degrees of maximum temperature. These temperatures will be compared with those of the same stations for the preceding day, and the difference, and sign, will be placed as required in the case of minimum temperatures.

82. A line of double weight, with proper signs in red, will show no change in maximum temperatures in twenty-four hours.

83. On the 11 p. m. chart, the character of the sunset will be shown by Signal Service symbols, *i. e.*, by a vertical tangent, equal in length to the diameter of the circle, and drawn on the west side, in different colors, as follows, viz: Fair, by red; foul, by blue; green, by green; yellow, by yellow. Doubtful sunsets will be shown by an interrogation mark in blue on the west side of the circle.

84. When auroras or halos are reported from stations they will be shown on this chart by a circle drawn within the station circle, auroras in red, halos in blue.

85. Chart No. 7 will show within the circle the temperature of the dew-point—thus, ㊺; without the circle, and if practicable, immediately to the right, the temperature of the air and the depression of the dew-point below the temperature of the

air—thus, Ö44. The temperature of the air will be omitted from stations from which the dew-point is not required to be sent.

86. Lines in red, with proper figures, will show each 5° of equal depression of the dew-point. A line in blue will show the dew-point line of 32°.

B.—*Duties of clerks.*

87. The clerical force of this division will be divided into three reliefs. The first relief from 8 a. m. until 11.30 a. m. The second relief from 3.30 p. m., until relieved by the officer in charge. The third relief from 11.30 p. m., until relieved by the officer in charge.

88. The sergeant, or other enlisted man, in charge of the stations division relief on duty will, during the translation, in the absence of a commissioned officer, be responsible for the discipline in the indications room, and his orders will be promptly obeyed by all men in the room.

89. The clerks will be designated as 1, 2, 3, 4, 5, and 6, with division of duty, in regular detail, as follows:

	A. M.	P. M.	Midnight.
Clerk 1	Chart 1	Charts 6 and 7	
Clerk 2		Chart 1	Charts 6 and 7.
Clerk 3	Charts 6 and 7		Chart 1.
Clerk 4	Charts 2 and 3	Charts 2 and 3	
Clerk 5		Charts 4 and 5	Charts 4 and 5.
Clerk 6	Charts 4 and 5		Charts 2 and 3.

90. On the 5th day of each month, at the 3 p. m. report, each clerk will assume the duties of the next succeeding number as indicated above, except that 6 will be assigned to the duties of 1.

91. The clerk charged with the preparation of Chart 1 of each report will write the synopsis and indications, prepare all signal orders and special telegrams, and adjust the cautionary-signal board from the signal orders as these orders are read by the assistant in charge. (Ins. 49, 1877.)

92. Each clerk will write his initials in the lower right-hand corner of the chart prepared by him, and he will be held responsible for the correctness and completion of such chart. In case of delay in the receipt of data, he will complete the lines at the first opportunity after the receipt of such data. The clerk entering late data will at the same time enter the eight and twenty-four hour changes. (L. R. 6679, Mis., 1884.)

C.—*Preparation of synopsis, indications, special bulletin, &c.*

THE SYNOPSIS.

93. The following statements, briefly made, are essential to the "synopsis:"

The regions of highest and lowest barometer, and, if within the limits of the chart, the location and path of the storm-center; in special cases, the direction of movement of high barometers; for the several meteorological districts—the weather, the temperature, and the wind-direction; special temperatures whenever 15°, or more, above or below the normal; heavy rainfalls in past twenty-four hours at selected stations; and the rise and fall of rivers. (G. O. 28, 1873; Ins. 3, 1881; Ins. 69, 1884.)

THE INDICATIONS.

94. The following statements, briefly made, are essential to the "indications:"

For the ensuing twenty-four hours, from the time of observation, in the several geographical districts, the expected condition of weather, wind, temperature, and barometer; anticipated frosts and freezing weather as far in advance as possible; changes anticipated in the rise and fall of rivers; and, at the end, the stations, or when the display is general, the regions, where storm-signals are displayed. (G. O. 28, 1873; Ins. 13, 1877; Ins. 46, 1881; Ins. 69 and 131, 1884.)

95. New forms of expression are forbidden until approved by the Chief Signal Officer.

96. When practicable, use the word veering when the wind changes direction with the hands of a watch, and backing when it changes contrariwise.

97. When practicable, follow the geographical districts in the order shown on Form 109*a*; and when the weather reports justify such minuteness, name individual States, Territories, lakes, &c.

98. The use of the words or, mostly, probably, possibly, and pressure is prohibited in all predictions. (Mem., Dec. 13, 1883.)

99. Districts will not be grouped together, but predictions will be made for each district separately, except when the same prediction can be applied to two or more districts. (Mem., Dec. 13, 1883.)

100. Indications of changes in the barometer will be made only when marked or decided changes are likely to occur.

101. Predictions will be made for the following districts, States, and localities: At 7 a. m., 3 p. m., and 11 p. m., for New England, the Middle Atlantic States, the South Atlantic States, the East Gulf States, the West Gulf States, the Ohio Valley and Tennessee, the lower lake region, the upper lake region, the Upper Mississippi Valley, and the Missouri Valley; at 11 p. m., for Colorado, Kansas, and Indian Territory, New England (special), Pennsylvania and Maryland, Northern Alabama, Ohio, the vicinity of New York and Philadelphia, the vicinity of Baltimore and Washington, the vicinity of Albany, and Southern Virginia; at 7 a. m., for New England (special), and for Omaha and vicinity; and such other special predictions as may be ordered from time to time by the Chief Signal Officer. The tri-daily indications for the above-named districts and the 11 p. m. indications for Colorado and the vicinity of New York and Philadelphia will be written on Form 109*a*, all the others on Form 201. The indications for Pennsylvania and Maryland will be sent by messenger to the Baltimore and Potomac depot, and the 7 a. m. indications for New England (special) to W. E. Barrett, 511 Fourteenth street. The other, Form 201, will be filed in the telegraph room. The 11 p. m. and 7 a. m. indications for New England (special) will be for the ensuing twenty-four and forty-eight hours, and those for 11 p. m. will be sent to the observers at Boston, Mass., and New Haven, Conn. The indications for Albany and vicinity will be sent, "charges collect," to James H. Manning, "The Argus," Albany, N. Y. The indications for Ohio, Northern Alabama, and Pennsylvania and Maryland will be sent as railway weather signals, as provided for in paragraphs 152–5. The indications for Omaha and vicinity will be sent to the observer at Omaha. The indications for the vicinity of Baltimore and Washington will be sent, "charges collect," to the Baltimore Sun, and also to the Washington papers. The indications for Southern Virginia will be sent to the Editor, Dispatch, Richmond, Va.

102. Such parts of the synopsis, indications, and special bulletin as may be of special interest will be marked in red pencil or other distinguishing color. (Mem. 128, 1884.)

103. The following examples are given as models:

WASHINGTON CITY, *Monday*, ——— ———, 1 a. m.

SYNOPSIS FOR THE PAST TWENTY-FOUR HOURS.

The storm which was central yesterday morning in Northern Michigan has moved in a southeasterly direction, and is now central over Lake Erie. The barometer is highest in the South Atlantic States and lowest in the lower lake region. The temperature has risen from 3° to 10° in the lower lake region and New England; it has fallen from 13° to 18° in the Missouri Valley; and is from 20° to 30° above the normal in the Ohio and Upper Mississippi Valleys. Heavy rains have fallen at ——— (stations). Fair weather and southwesterly winds prevail in all districts east of the Mississippi, except in the upper lake region, where the winds are westerly. The winds in the Missouri Valley have shifted to northerly.

The Mississippi has risen 18 inches at Cairo, and the Cumberland 22 inches at Nashville; the Ohio has fallen 19 inches at Cincinnati, the Tennessee 15 inches at Chattanooga, and the Savannah 11 inches at Augusta.

WASHINGTON CITY, *Monday*, ——— ———, 1 a. m.

INDICATIONS FOR THE SUCCEEDING TWENTY-FOUR HOURS.

For *New England:* Fair weather, followed by increasing cloudiness and local rains; southerly winds; lower barometer; slight rise in temperature.

For the *Middle Atlantic States:* Fair weather; south to west winds; lower barometer; higher temperature.

For the vicinity of *New York* and *Philadelphia:* Warmer, fair weather.

For the *Gulf States:* Fair weather; southerly winds; lower barometer; stationary temperature.

For the *Ohio Valley* and *Tennessee:* Fair weather; westerly, veering in the northern part to northerly, winds; lower temperature.

For the *Lower Lake Region:* Fair weather, followed by local rains; southwesterly, shifting to northwesterly, winds; falling, followed by rising, barometer; lower temperature.

For the *Upper Lake Region:* Local rains, followed by clearing weather; winds shifting to cooler northerly; higher barometer.

For the *Upper Mississippi* and *Missouri Valleys:* Fair weather; northerly winds; higher barometer; lower temperature.

For *Colorado:* Colder, fair weather.

RIVERS.—The Ohio will fall above Louisville; the Tennessee will rise at Chattanooga; and the Savannah will rise at Augusta.

SIGNALS.—Cautionary signals continue at Oswego, Charlotte, Buffalo, Erie, and Cleveland, and are ordered for all stations on the Atlantic coast from Chincoteague, Va., to Eastport, Me. (Ins. 131, 1884.)

SPECIAL PREDICTIONS FOR TUESDAY.—Frosts and freezing weather are indicated for the Missouri Valley, and thence southward to Northern Texas. Warmer, fair weather is indicated for the Middle Atlantic States and New England.

THE SPECIAL BULLETIN.

104. Immediately after the completion of the synopsis and indications from the a. m. reports, a "special bulletin" will be prepared daily, except Sunday. In the bulletin no reference will be made to barometric conditions, and all technical terms, such as pressure, barometer, &c., will be avoided. It will begin with the most important feature as determined from the reports of the last twenty-four hours; will announce the approach of hot and cold waves; of frosts; the river conditions when dangerous floods exist or are anticipated; the movements of well-defined storms, giving the direction and naming the districts where they will be most severe; the amount of unusual changes in temperature, in general terms, and the current temperature at the several stations where the change has been greatest; the actual rainfall exceeding 1 inch in twenty-four hours for selected stations; the first appearance and movements of locusts; and will contain all data relative to cold-wave signals. Storms and temperature waves will be treated as specifically as possible, and their progress carefully traced from day to day. (Ins. 140, 1884.)

105. The bulletin will close with such indications of weather, storm movements, and river changes as it may be possible to make for the succeeding thirty-six or forty-eight hours. The indications referring to the movements of freshet waves, when practicable, will be given for several days in advance. When frosts which may prove injurious to crops are likely to occur, the bulletin will contain special warnings of their approach, which the officer in charge will telegraph to the observer at stations in the threatened districts with directions to give them the widest distribution.

106. Special temperatures will be given as follows: 7 a. m. temperatures from June 1 to September 30, from Eastport, Montreal, Quebec, Mount Washington, Cleveland, Alpena, Duluth, Saint Paul, Denver, and San Francisco; and from November 1 to April 30, the 3 p. m. temperatures from Washington, Norfolk, Savannah, Atlanta, Jacksonville, Pensacola, New Orleans, Galveston, Los Angeles, and San Diego.

107. The officer in charge will, whenever possible, incorporate in the special bulletin probable changes in the weather in the lake regions and Upper Mississippi and Missouri Valleys, and telegraph the same to the observer at Baltimore, Md., who will furnish a copy to the secretary of the Baltimore Corn and Flour Exchange. (Ins. 28, 1883.)

108. The 10 a. m. special bulletin will be printed in a manner similar to the model bulletin on file in the correspondence and records division, and will be posted in frames at all places where the morning weather chart is displayed. (Ins. 46, 1881; Ins. 80, 1882.)

109. On the first day of each month the officer in charge of the indications division during the preceding month will prepare a special bulletin, in which will be incorporated general remarks on the mean temperature and total precipitation of that month in the several districts, together with brief descriptions of damaging frosts, severe storms, &c., which may have occurred during the same period. The bulletin will close with special directions to those receiving it to give it the widest publication. A copy of the bulletin will be sent direct to the printer before 3 p. m. of the first day of the month, and will be printed in the same manner as the daily special bulletin. The edition will consist of three hundred copies. (Ins. 87 and 108, 1884.)

SPECIAL PREDICTIONS.

110. At the close of the indications prepared from the 11 p. m. reports, such indications of weather, storm movements, and river changes will be added as it may be possible to make for the succeeding forty-eight hours.

111. In making special predictions the officer in charge of the indications division will use the names of the districts as shown on the district map. (L. R. 6679, Mis., 1884.)

STORM WARNINGS.

112. Cautionary signals will be ordered whenever the officer in charge considers it probable that there will occur at the cautionary signal station, or within 100 miles of it on any navigable water, a wind-velocity dangerous to navigation, *i. e.*, reaching a velocity of 25 miles an hour as registered by the anemometer on land. If, at the next regular report following the ordering of signals, it appears that the danger is not so imminent as to justify the display, the signal will be ordered down. (G. O. 28, 1873.)

113. Cautionary off-shore signals will be ordered whenever the officer in charge considers it probable that there will occur at any cautionary signal station on the Atlantic or Gulf coasts dangerous winds blowing in an off-shore direction. The indications officer will assume the undivided responsibility for the display or lowering of all signals. Conditional orders for such display or lowering will not be issued. (L. R. 6679, Mis., 1884.)

114. Signals will be ordered up in the words "Up signals," or "Hoist off-shore signals," and will be ordered down in the words "Signals down." Off-shore signals will be changed to cautionary signals in the words "Change off-shore signals to cautionary." If the off-shore signal is displayed and the wind at the time of the receipt of the order "Signal down" has a velocity of 25 miles or more per hour, the signal will be kept displayed and the velocity of the wind will be ascertained from the self-register at least once in each hour. As soon as the velocity has fallen below 25 miles in any one hour, the signal will be lowered. (L. R. 6679, Mis., 1884.)

115. Whenever cautionary signals are ordered for a storm and the danger from the storm has passed and the signals are continued in anticipation of a second dangerous storm, a special explanatory message will be sent to the stations interested. (Ins. 63, 1880.)

116. The officer in charge will accompany all orders for the display of the several storm-signals with a brief and carefully drawn explanatory message, on Form 206. (Ins. 53, 1882.)

117. When cautionary or other signals are ordered up or down at the stations on the lakes or the Gulf, notification will be sent by telegraph to other stations in the same locality, as directed below. The notification, besides the information that "up," "off-shore," "down signals," &c., are ordered for other stations, will contain the explanatory message embraced in the cautionary order.

118. When signals are ordered up or down at any of the stations on the Gulf coast, viz, Key West, Cedar Keys, Pensacola, Mobile, New Orleans, Port Eads, Galveston, and Indianola, notifications will be sent to all of these stations.

119. When signals are ordered up or down on the lakes notifications will be sent to stations as follows:

Signals ordered on Lake Superior, to stations on Lakes Superior, Huron, and Michigan; signals ordered on Lake Michigan, to stations on Lakes Michigan, Huron, and Erie; signals ordered on Lake Huron, to stations on Lakes Huron, Erie, and Ontario; signals ordered on Lake Erie, to stations on Lakes Erie, Ontario, and Huron, and to Mackinaw City; signals ordered on Lake Ontario, to stations on other lakes. When signals have been ordered displayed at one or more stations on one of the lakes, and due notification has been given, notification of the ordering of additional signals on that lake will not be sent to stations on other lakes. These notifications apply to orders to display, and the orders for lowering signals.

120. The kind of signal shown at Sandy Hook, New Jersey, will be the same as that at New York City. (Ins. 1, 1884.)

121. The officer in charge may give a more extended notification of the ordering of signals when, in his opinion, necessary. (Ins. 91, 1882.)

122. Display boards showing stations where cautionary signals are up, together with the kind of signal, will be kept in the indications division. (L. R. 6679, Mis., 1884.)

123. The officer in charge will verify the orders for display and discontinuance of signals and the record on the display bulletin-board, after which the order will be numbered and entered in the cautionary-signal order book and sent to the telegraph room.

124. At midnight, after completing the press report and special bulletin, and issuing the necessary signal orders, if any, the "good night" message will be prepared, copied in the "signal-order book," verified, and sent to the telegraph room.

125. Whenever a storm is anticipated from Cape May, N. J., to Cape Henry, Va., cautionary signals will be ordered for Baltimore, Md. They will be considered justified whenever the wind at any of the stations from Cape May to Cape Henry, inclusive, reaches a velocity of 25, or more, miles per hour. (Ins. 109, 1883.)

STORM WARNINGS. (CANADIAN SERIES.)

126. Whenever the conditions indicate dangerous weather in the Dominion of Canada, a message will be transmitted to Professor Carpmael, Toronto, Canada, on the usual form in cipher. The cipher words for districts are:

Collingwood for Georgian Bay, Saugeen for Lake Huron, Kingston for East Ontario, Toronto for West Ontario, Stanley for Lake Erie, Montreal, Quebec, Father Point, Gaspe, Bathurst, Shediac for North New Brunswick, Saint John, Pictou for North Nova Scotia, Halifax, Sidney, Yarmouth.

127. The cipher words expressing time and date, published in the cipher book issued from this office, will be used to indicate the time and date when a storm may be expected, thus:

"Storm (or severe storm) Saugeen, Collingwood, Stanley, Cash; Toronto gaul; Kingston neck; Montreal, Quebec, cat;" by which it will be understood that a storm (or severe storm) is expected to reach Saugeen, Collingwood, and Stanley between 7 a. m. and 3 p. m. (75th meridian time), on the 10th; Toronto between 3 p. m. and 11 p. m. on the 10th; Kingston between 11 p. m. on the 10th, and 7 a. m. on the 11th; Montreal and Quebec between 7 a. m. and 3 p. m. on the 11th.

128. When danger is past or no longer threatens any Canadian station that has been warned, a dispatch will be sent to Professor Carpmael, containing the following words:

(1) Safety; (2) name of station or stations; (3) date and time (cipher word). A "good-night" message will also be sent to Professor Carpmael at midnight.

129. All messages relating to storm-warnings will be verified in the same manner as original orders and entered in the cautionary-signal order book, but not numbered.

130. A telegram will be sent at or before 9.30 a. m. each Sunday to the director of the Magnetic Observatory at Toronto, Canada, giving the following information:

If there be no definite warnings for Canadian stations based on the current morning reports, and no expectation that there will be any founded on the afternoon reports of the same day, and any warnings sent on the previous day have been acknowledged, the absence of danger will be expressed by the words "nothing coming."

If warnings have been sent, based on Saturday afternoon or night reports, for which acknowledgments have not been received, the fact will be expressed by the words "Saturday afternoon," or "Saturday night," as the case may be, followed by the names of stations for which warnings have been sent.

If the morning reports do not make the immediate issue of warnings necessary, but indicate that there is a fair probability that a warning may be necessary after the receipt of the afternoon reports, this information will be expressed by the words "Sunday evening," with the names of the stations at which the warning will probably be needed.

Warnings based on the current reports will be sent in the usual manner. (Cir. 23, 1874.)

FROSTS.

131. Officers will carefully study the meteorological conditions preceding damaging frosts. Such as threaten any crop or fruit will be announced in indications or by special telegraphic bulletins as early as consistent with reasonable safety, and, if possible, two or three days in advance. These frost warnings will define the regions threatened, state the time, and distinguish between *frosts* and *freezing* weather. The officer in charge will call upon the other members of the indications board for their opinion as to the minimum temperature to be expected and the area threatened. (Ins. 154, 1881; Ins. 155, 1882.)

132. During the period of navigation when freezing temperatures are anticipated in any canal region, special forecasts will be made in the indications and special bulletin.

133. Whenever minimum temperatures of 40° or less are expected frost warnings will be telegraphed to the centers named in the several schedules filed in the indications and telegraph divisions: For the fruit-growing regions, from November 15 to April 15; for the tobacco-growing regions, from September 1 to November 1, or until after killing frosts; for the sugar-growing regions, from October 1 to February 1, or until after killing frosts; for the fruit and vegetable districts about Chattanooga, Tenn., from September 15 to May 1; for districts about Georgetown, S. C., from October 1 to April 1. (Ins. 69, 1879; Ins. 128, 1882; Ins. 6, 21, 24, and 31, 1883.)

134. The frost warnings for the sugar-growing regions of Louisiana will be telegraphed to the Signal Service observer at New Orleans, who will promptly furnish a copy to the secretary of the Louisiana State weather service. The officer in charge of indications will exercise great care in preparing these warnings and make them descriptive of the conditions expected to occur in the northern and southern parts of the State; he will also give the time at which the cold-wave or frost will probably reach the State. Warnings will not be given unless light frosts are expected at least in the northern section of the sugar-growing region; and when the temperature will probably fall below, or to, freezing in *any* section of the sugar-growing region it will be so stated. (Ins. 123, 1884.)

135. Special frost indications will be prepared for Iowa, Minnesota, Dakota, and other of the extreme Western States, and telegraphed to the Signal Service observer at Pittsburg, Pa. (Ins. 106, 1883.)

136. The following table shows the present arrangement for the distribution of frost warnings, subject to such modifications as may become necessary from time to time:

Center or station.	Address.	Center or station.	Address.
Sugar and fruit-growing interests.		*Tobacco-growing interests*—Cont'd.	
Charleston, S. C	Observer.	Hartford, Conn	Manager Western Union Telegraph office.
Chattanooga, Tenn.	Observer, he to furnish copies to the press and to the Mission Ridge Fruit-Growers Association.	Lancaster, Pa	Do.
		Lexington, Ky	Do.
		Louisville, Ky	Observer.
Columbia, Tex	J. S. Smith.	Lynchburg, Va	Do.
Galveston, Tex	Observer.	Madison, Wis	Manager Western Union Telegraph office.
Georgetown, S. C	David Risley.		
Jacksonville, Fla	Observer.	Memphis, Tenn	Observer.
New Orleans, La	Do.	Nashville, Tenn	Do.
		New Haven, Conn	Do.
Cranberry-growing interests.		New York City	Do.
		Palmer, Mass	Manager Western Union Telegraph office.
Boston, Mass	Do.	Philadelphia, Pa	Observer.
Philadelphia, Pa	Do.	Raleigh, N. C	Manager Western Union Telegraph office.
Tobacco-growing interests.		Richmond, Va	Do.
		Do	W. H. Greene, superintendent Richmond and Danville Railroad.
Asheville, N. C	Penniman & Co.		
Cincinnati, Ohio	Observer.	Saint Louis, Mo	Observer.
Elmira, N. Y	Manager Western Union Telegraph office.	Springfield, Mass	Manager Western Union Telegraph office.
Hannibal, Mo	Do.	Washington City	Observer.
Harrisburg, Pa	Do.	Wilmington, Del	Manager Western Union Telegraph office.
Do	Superintendent of telegraph, Reading Railroad Company.	York, Pa	Do.

COLD WAVES.

137. A square white flag, with black square in center, will be displayed at stations upon receipt of telegraphic orders from this office, to indicate that a "cold wave" is approaching, and will be designated the "cold-wave signal."

Whenever a decided fall in temperature is expected to occur at any of the stations named in paragraph 138, the officer in charge of the indications division will telegraph the observer in the following form: "Hoist cold-wave signal; temperature will probably fall —— degrees during next —— hours."

Great care must be exercised in ordering cold-wave signals, and, if possible, they will be ordered in season for the observers at printing stations to give notice in the Farmers' Bulletin of the coming cold wave.

When the temperature has reached the minimum, the cold-wave signal will be ordered down by telegraph, thus: "Cold-wave signal down." (Ins. 105, 1884.)

138. The following is a list of stations at which cold-wave signals will be displayed: Albany, N. Y.; Atlanta, Ga.; Auburn, Ala.; Augusta, Ga.; Baltimore, Md.; Bangor, Me.; Boston, Mass.; Buffalo, N. Y.; Burlington, Iowa; Cairo, Ill.; Charleston, S. C.; Charlotte, N. C.; Chattanooga, Tenn.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Columbus, Ohio; Concordia, Kans.; Davenport, Iowa; Denver, Colo.; Des Moines, Iowa; Detroit, Mich.; Dodge City, Kans.; Dubuque, Iowa; Galveston, Tex.; Grand Haven, Mich.; Greencastle, Ind.; Indianapolis, Ind.; Jacksonville, Fla.; Kansas City, Mo.; Keokuk, Iowa; Knoxville, Tenn.; Leavenworth, Kans.; Little Rock, Ark.; Logansport, Ind.; Louisville, Ky.; Lynchburg, Va.; Madison, Wis.; Memphis, Tenn.; Milwaukee, Wis.; Montgomery, Ala.; Nashville, Tenn.; New Haven, Conn.; New London, Conn.; New Orleans, La.; New York City; Norfolk, Va.; Omaha, Nebr.; Philadelphia, Pa.; Pittsburg, Pa.; Portland, Me.; Rochester, N. Y.; Saint Louis, Mo.; Saint Paul, Minn.; Sandusky, Ohio; Savannah, Ga.; Shreveport, La.; Springfield, Ill.; Toledo, Ohio; Vicksburg, Miss.; Washington City; Wilmington, N.C.

139. Orders relating to cold-wave signals for Kansas City will be addressed to T. S. Case, postmaster, and dispatcher's office, Fort Scott and Gulf Railroad. Orders for Auburn, Ala., will be addressed to P. H. Mell, jr. (L. R. 6679, Mis., 1884.)

140. Whenever cold-wave signals are ordered for Columbus, Ohio, similar warnings will be telegraphed to the director, Ohio meteorological bureau, Columbus, Ohio. (Ins. 2, 1885.)

141. Whenever cold waves are expected to occur in the vicinity of the Baltimore and Ohio Railroad, the officer in charge of the indications division will telegraph

warnings of their approach to Superintendent Seldon, Baltimore; General Superintendent Zeublin, Chicago, and Superintendent Leslie, New York City. The warnings will contain the names of the States in which the cold waves are expected. The following list comprises the States over which the Baltimore and Ohio system chiefly operates: New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, and Kentucky. (Mem. 127, 1884.)

142. A display board showing where cold-wave signals are up will be kept in the indications division. (L. R. 6679, Mis., 1884.)

143. Cold-wave signal orders will be verified by the officer in charge, entered in the cold-wave signal order-book, and checked with the display board, after which they will be sent to the telegraph room. (L. R. 6679, Mis., 1884.)

144. During his tour of duty the officer in charge of the indications division will make a study of approaching changes of temperature as indicated in the Northwest, Montana, Manitoba, and Dakota, and adjacent sections, with a view of determining rules of value in predicting cold and warm waves. A careful study of the charts on file for past years will probably indicate practical rules of great value. In connection with the foregoing he will include a special study of atmospheric changes which precede frosts. (Ins. 100, 1884; Mem. 78, 1884.)

FLOODS.

145. The river reports will be entered on a special form and the changes briefly noted in the synopsis. Whenever greater than 12 inches they will be stated thus: "The rivers have risen (or fallen) at" [here give the names of stations and amount of change]; or "decidedly risen (or fallen) at ———"; or give the number of feet, where the change is remarkable. When the river is near or above the danger-line at any place all changes will be noted. When the probable changes may be of great importance they will also be mentioned in the special bulletin. (G. O. 28, 1873.)

146. Telegraphic warnings may be sent at the discretion of the officer in charge to all districts menaced by dangerous floods.

147. Whenever danger from floods in the Potomac River is anticipated, and word is sent to the merchants of Georgetown and to the press at Washington, &c., of such impending floods, a duplicate message will be sent by the officer in charge of indications to the superintendent of the United States carp ponds, through the Telephone Exchange and National Museum. (Ins. 17, 1884.)

NORTHERS.

148. When "northers" are anticipated telegraphic warnings will be sent to the regions menaced according to the schedule in the indications division, subject to modification from time to time.

Co-operating railroad.	Central distributing station.	Persons addressed.
Burlington and Missouri River Railroad, Nebraska.	Omaha, Nebr	General manager.
Atchison, Topeka and Santa Fé Railroad	Topeka, Kans	Superintendent of telegraph.
Missouri Pacific Railway	Saint Louis, Mo	Superintendent of transportation.
Saint Louis and San Francisco Railway	Springfield, Mo	Superintendent of telegraph.
International and Great Northern Railroad	Palestine, Tex	Assistant superintendent of telegraph.
Dallas and Wichita Railroad	Dallas, Tex	General manager.
Texas and Saint Louis Railway	Pine Bluff, Ark	General superintendent.
Texas and Pacific Railway	Marshall, Tex	Superintendent of telegraph.
Houston and Texas Central Railway	Houston, Tex	General superintendent.
Galveston, Harrisburg and San Antonio Railway.	... do	Do.
Mexican National Railway	Corpus Christi, Tex	Do.

TORNADOES.

149. The officer in charge of indications will carefully study the tri-daily weather charts of previous years, with a view of becoming familiar with the atmospheric conditions which are likely to exist during the occurrence of tornadoes in the various sections of the country.

150. When the current weather report is such as to indicate the probable occurrence of tornadoes, the indications prepared from such report will contain special warning, in the following form:

"Dangerous local storms, or violent local storms are indicated for ———" (naming districts or States).

These warnings will be telegraphed to the Signal Service stations in the threatened districts. The word "tornadoes" will not be used in making these forecasts. (Ins. 60, 1883.)

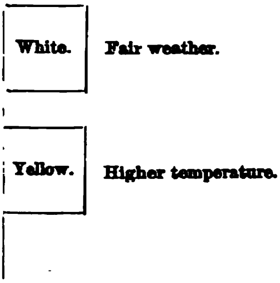
Locusts.

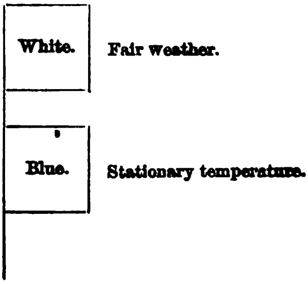
151. The first appearance and subsequent movement of locusts when reported to this office will be mentioned in the special bulletin and synopsis.

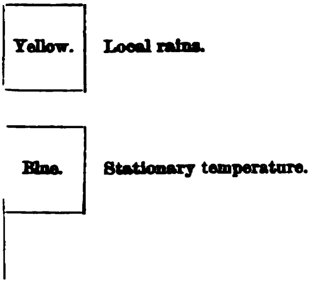
Railway Weather Signals.

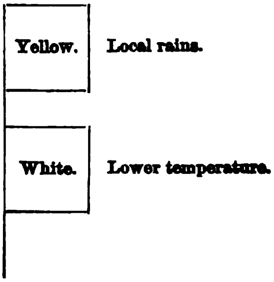
152. The officer in charge of the indications division will telegraph to Prof. P. H. Mell, jr., director Alabama State weather service, Auburn, Ala., at 1 a. m., daily, special weather forecasts for the ensuing day for the State of Alabama.

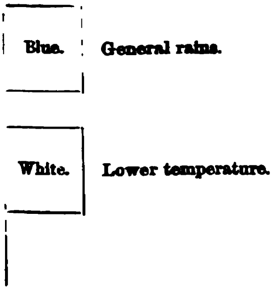
The forecasts will contain predictions of temperature, whether higher, lower, or stationary; general rain, local rain, or fair weather; and will be telegraphed in conformity with the following system of flag signals:

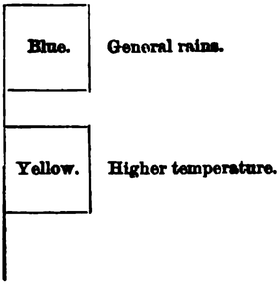


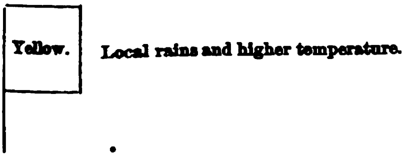


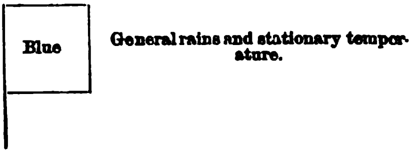












The forecasts will be telegraphed in the exact words printed opposite the signals, as shown herein. (Ins. 107, 1884.)

152*a*. Since the adoption of the above signals by the Alabama weather service, the system has been superseded by the following:

EXPLANATION OF SIGNALS.

PREPARATION OF INDICATIONS.

The weather indications furnished to the State by the Chief Signal Officer are based on observations taken in all parts of the country three times a day. The morning indications are prepared at 11 p. m. (eastern standard time) of the preceding night, and hold good till the following morning.

DISPLAY OF FLAGS.

In accordance with these indications the proper official flags should be selected and promptly displayed. If elevated on a pole, they should be so arranged as to read downward. If the indications read ——— ——— followed by ——— ———, then a space, the width of a flag, should be left vacant on the pole to indicate "*followed by*." The signals should be withdrawn at 3 p. m.

MEANING OF FLAGS.

No. 1 [white flag] referr always to fair or clear weather.

No. 2 [orange flag] refers always to local rains.

No. 3 [blue flag] refers always to general rains.

No. 4 [black triangle flag] refers always to temperature. When placed above either Nos. 1, 2, or 3 indicates rising temperature; when placed below these numbers (1, 2, or 3) indicates falling temperature, when absent from the pole stationary temperature is indicated.

No. 5 [white flag with black square] refers always to decidedly colder weather, and is generally issued twenty-four hours in advance of the expected fall of temperature. This signal is not ordered unless it is expected that the temperature will fall to 45 degrees Fahrenheit, or below, within the time stated in the order.

No. 6 [orange flag with black square] indicates the approach of a cyclonic wave.

EXAMPLES.

"Cooler, fair weather," display flag No. 1 with No. 4 below it.

"General rains, higher temperature," display No. 3 with No. 4 above it.

"Stationary temperature and local rains," display No. 2 only.

"Stationary temperature and general rains, followed by cooler clear weather," display No. 3 (space) and No. 1 with No. 4 below it.

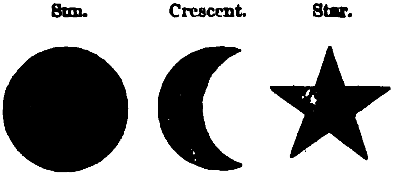
Public notice of these explanations should be secured in local newspapers as generally as possible, and by posting this card near the point of display where it can be examined by the public.

153. The officer in charge of the indications division will telegraph to the director, Ohio meteorological bureau, Columbus, Ohio, at 1 a. m., daily, special weather forecasts for the ensuing day for Ohio. An additional telegram will be forwarded at 10 a. m., whenever sudden changes render it necessary.

154. The forecasts will contain predictions of temperature, whether higher, lower, or stationary; general rain or snow, local rain or snow, or fair weather; and will be forwarded in conformity with the adopted system of signals.

155. The signal will consist of two figures which differ in color, being red or blue, and in form being shaped like the sun, a crescent, or a star. The red color refers to the temperature, and the blue color to the state of the weather, as rainfall or snow; they are used as below:

Railway weather signals.



Red.—Sun, higher temperature; crescent, lower; star, stationary.

Blue.—Sun, general rain or snow; crescent, clear or fair weather; star, local rain or snow.

Similar forecasts will be prepared for the region of the following-named railroads and telegraphed at 1 a. m., daily:

Cumberland Valley Railroad, General J. F. Boyd, superintendent, Chambersburg, Pa.

Frederick division, Pennsylvania Railroad, J. B. Hutchinson, superintendent, York, Pa.

The officer in charge of the indications division will send or designate the symbols to be used, and will not telegraph the written indications. (Ins. 31, 1884.)

The 11 p. m. indications for New England will also be sent by this code, except that the flag will be designated by numbers instead of by symbols, as follows: Red sun, flag No. 1; red crescent, flag No. 2; red star, flag No. 3; blue sun, flag No. 4; blue crescent, flag No. 5; blue star, flag No. 6.

INDICATIONS BOARD.

156. The "indications board" will be permanently organized, the personnel of which will be announced from time to time.

157. The members of the board will successively perform, for one month each, the following duties:

(*a*) Indications.
(*b*) Inspection of stations.
(*c*) Fact and international bulletin division.
(*d*) Charge of instruction and personal study.

158. The members present will assemble at 10 o'clock a. m., daily, in the indications room, to study and discuss all meteorological conditions, but the indications officer will prepare his indications and bulletin independently, and will be responsible for them.

159. When the seasons arrive at which frosts, floods, northers, or the flights of locusts may be expected, each member of the board present will inspect daily the meteorological conditions of the country to discover any danger from those causes, and will on occasion notify the senior officer present, who will at once call the full board together for further study and consultation upon the subject.

160. The senior officer of the board present will have general charge during sessions of the board, and will be responsible for the proper performance of its work, in accordance with the published regulations. The officer specially detailed on indications for the current month will be responsible for all indications, signal orders, and special bulletins during his tour, availing himself of the advice of the board when he so desires.

161. It is the duty of any member of the board to notify the officer in charge of the indications division of any weather indications which he thinks may have escaped attention.

162. All communications affecting the work or duties of the board will be transmitted through the senior officer to the Chief Signal Officer.

163. The board will report daily, in writing, to the Chief Signal Officer the result of the previous day's work, embracing in the report of the board all omissions or other matters seeming to require attention, including those, if any, of the indications fficer.

164. Verifications of predictions will be made by the board. (Ins. 89, 1883.)

VERIFICATIONS OF INDICATIONS.

165. The indications board will determine the percentage of verification of the current indications in accordance with the following instructions:

(*a*) The percentage of verifications of wind predictions will be determined by considering only the direction.

(*b*) The indications made up from each report will be compared with the facts shown by the three succeeding tri-daily reports.

(*c*) In estimating the percentages, ascertain whether the conditions predicted for each district have prevailed in it to the amount of one-fourth, one-half, three-fourths, or the whole of the area of the district.

(*d*) Predictions which are found to be more than three-fourths verified will be considered completely verified, and represented by 100 or 100 per cent. in that column of the blank to which the prediction refers. Predictions which are not wholly verified will be represented in the proper column of the blank by 75 per cent., 50 per cent., or 25 per cent., as the facts may warrant. Predictions which have fallen below 25 per cent. in verification will be rated as not verified and represented by 0 in the proper column.

(*e*) If, in the indications for any particular district, any class of predictions is not referred to, such omissions will be represented by a dash (——).

(*f*) To determine the percentage of verification, divide the sum of the percentages of a single class for the month by the number of predictions made of that class. To determine the percentage of verifications for any district, divide the sum of the percentages of the several classes of predictions by the number of classes. To determine the percentage of verification for the United States, divide the sum of percentages of verifications by the number of districts.

(*g*) A maximum percentage of verification can be got only when the four elements under each district are named in the indications of the entire month.

(*h*) To determine the percentages of failures to predict for any element, divide the number of failures to predict for that element by the entire number of tri-daily reports during the month. (G. O. 28, 1873; Cir. 7, 1874.)

(*i*) The indications for the three districts on the Pacific coast will be verified as to weather according to the usual rule, and will be published in the general percentages of verifications. (Ins. 17, 1879.)

(*j*) The indications will be verified from a printed copy first corrected by the assistant in charge of the indications division. (Ins. 9, 1881.)

(*k*) the statement of percentage of signals justified, &c., will show the number of storms reported with wind velocity of 25 miles or over per hour for which cautionary signals have not been ordered. (Ins. 24, 1880.)

(*l*) Indications of barometer changes will be verified and counted in making up the monthly average of verifications. (Ins. 69, 1884.)

(*m*) In verifying temperature in special predictions, the three charts of the day for which the prediction is made will be compared with the three corresponding charts of the preceding day.

(*n*) If at the time the prediction is made, precipitation is actually taking place, and precipitation is predicted, the prediction will not be considered fully verified unless precipitation is recorded on the second chart.

(*o*) The expression "continued cold" or "continued warm" weather, when used, will be understood to mean that the temperature will remain stationary.

(*p*) When light variable winds are predicted, any "calms" reported will be considered in verifying as "variable."

(*q*) The expression "partly cloudy" will be understood to mean totally cloudy at a portion of the stations.

(*r*) When fair weather is predicted and rain occurs within twenty-four hours the prediction will be verified on the basis of the area of rainfall in the district, giving zero for rain occurring over the entire district.

(*s*) In order to fully verify the prediction, "local rains followed by fair weather," precipitation must occur on the first or second charts, and no precipitation be reported in three-fourths of the district on the last chart.

(*t*) When "colder" or "warmer" weather, preceded by a "rise" or "fall" in temperature is predicted, the prediction for "colder" or "warmer" will be considered as applying to the twenty-four hour prediction.

REPORTS.

166. A tri-daily report of the time of completion and delivery of the daily publications of the indications division will be made in the form given below. The indications officer will lay these three reports on the Chief Signal Officer's table not later than 12 noon daily.

[Form No. 425*g*—1885.]

Indications officer's tri-daily report.

Date, ————————. Hour, ————————. Messenger's name, ————————.

Time delivered.	Special bulletin.	Farmers' bulletin.	Time delivered to messenger.	To whom delivered.		Time of delivery to be entered by receiver.	Signature of receiver.
....	....	....	....	N. Y. Associated Press........	Tri-daily list—always first.	....	....
....	....	....	....	U. S. Associated Press		....	....
....	....	....	....	W. U. Tel. Co		....	....
....	....	....	....	B. & M. Tel. Co		....	....
....	....	....	....	W. E. B., 511 14th St		....	....
....	....	....	....	B. & P. Depot		....	....
....	....	....	....	Secretary of War	Daily list.	....	....
....	....	....	....	Critic		....	....
....	....	....	....	Star		....	....
....	....	....	....	Post		....	....
....	....	....	....	Republican		....	....
....	....	....	....	Post Office		....	....
....	....	....	....	Journal	Weekly list, for Sunday.	....	....
....	....	....	....	Herald		....	....
....	....	....	....	Capital		....	....
....	....	....	....	Chronicle		....	....

Material for morning map delivered to printer, at ——— a. m.
Map completed and in hands of messenger at ——— a. m.
I certify that the foregoing is a true return for the report and date named.

——— ———, *Indications Officer.*

NOTE.—The midnight indications will be prepared and delivered to the Associated Press companies not later than 1 a. m. The indications officer will lay these reports on the table of the Chief Signal Officer not later than 12 m.

W. B. HAZEN,
Brigadier and Brevet Major-General, Chief Signal Officer, U. S. Army.

APPENDIX 3.

REPORT OF OFFICER IN CHARGE OF THE DIVISION OF THE PACIFIC.

SIGNAL OFFICE, WAR DEPARTMENT,
San Francisco, Cal., July 27, 1885.

SIR: I have the honor to make the following report of the operations of this division for the year ending June 30, 1885:

Having been informed that I would be ordered to take station at San Francisco, with a view to giving the people of the Pacific coast the full benefit to be derived from the Signal Service, and directed to make the necessary preparations, my time was occupied during December, 1884, and January, 1885, in extracting data from the Signal Service records in the office of the Chief Signal Officer.

In obedience to paragraph 5, Special Order No. 1, Headquarters of the Army, Adjutant-General's Office, Washington, January 2, 1885 (copy herewith marked A), and your letter of instructions of January 6, 1885 (marked B), I left Washington February 2, and reached San Francisco February 11.

In accordance with letter of instructions, War Department, Adjutant-General's Office, Washington, January 2, 1885 (marked C), on February 12, I left San Francisco for San Luis Obispo, Cal. After an examination of that section, including telegraph facilities, &c., I decided upon San Luis Obispo as the best location for a Signal Service station. February 16 I returned to San Francisco. Private George A. Riviére, Signal Corps, U. S. Army, reported to me for duty, having arrived February 15. I proceeded to Red Bluff, Cal., the 17th, and returned to San Francisco the 18th. Private B. S. Pague, Signal Corps, U. S. Army, arrived February 22.

Pursuant to your letter of instructions, Signal Office, War Department, Washington City, January 10, 1885 (marked D), I made an effort, February 25, to underrun the submarine cable between "The Presidio" and Alcatraz Island. With the facilities available it was found impossible to raise the cable; therefore the repair of the same was postponed until sufficient money should be at my disposal to enable me to hire the necessary apparatus for recovering the cable.

I was extremely fortunate in securing from March 1, 1885, rooms Nos. 45 and 46, fourth floor (across the hall from the operating rooms of the Western Union Telegraph Company), No. 302 Montgomery street, for use as an office. On March 21 I left for Monterey and Santa Cruz, Cal., and returned to San Francisco March 23.

The office supplies arrived from Washington March 26. On March 28 the preparation of tri-daily charts from the telegraphic reports began. Privates Pague and Riviére had become sufficiently expert in the preparation of the charts to begin the issue of the synopses and indications for the Pacific districts to the public through the San Francisco daily papers, the Associated Press, and the Farmers' Bulletin, twice daily; at 1 p. m., Pacific time, for the afternoon papers, and 9 p. m., Pacific time, for the morning papers and Farmers' Bulletin, excepting on Sundays at 9 p. m. only. I inclose a sample copy of the charts prepared (marked E), a copy of the synopses and indications (marked F), a copy of the Farmers' Bulletin (marked G), and a list showing the distribution of the synopses and indications (marked H). The percentages of verifications of the indications, made by myself, are:

	Per-centage.	Average for district.	Monthly average.
APRIL, 1885.			
North Pacific:			
Weather	88.5	84.4	83.62
Wind direction	91.7		
Temperature	73.1		
Middle Pacific:			
Weather	89.1	79.7	
Wind direction	78.8		
Temperature	71.2		
South Pacific:			
Weather	94.9	86.8	
Wind direction	89.1		
Temperature	76.3		

	Per centage.	Average for district.	Monthly average.
MAY, 1885.			
North Pacific:			
Weather	83.8	82.0	87.57
Wind direction	87.7		
Temperature	74.6		
Middle Pacific:			
Weather	96.1	85.7	
Wind direction	88.1		
Temperature	72.8		
South Pacific:			
Weather	93.4	95.0	
Wind direction	98.7		
Temperature	93.0		
JUNE, 1885.			
North Pacific:			
Weather	85.3	85.27	89.63
Wind direction	92.0		
Temperature	78.6		
Middle Pacific:			
Weather	96.4	89.29	
Wind direction	91.1		
Temperature	80.4		
South Pacific:			
Weather	98.2	94.34	
Wind direction	96.4		
Temperature	88.4		
General average	....	....	87.82

Since the opening of this office no cautionary signals have been ordered to be displayed at any of the signal stations along the coast; in fact no dangerous storms have passed over any portion of the coast of the Pacific districts.

At San Diego, Cal., on April 20, the wind reached a velocity of 25 miles per hour, from the west, during clear weather. The observer reports "Storm not considered dangerous to shipping or other interests."

Hourly wind velocities of over 24 miles per hour from a westerly direction have been of frequent occurrence at San Francisco, while clear or partly cloudy weather prevailed. The maximum velocity of 36 miles per hour from the west was recorded June 21. On April 16 four schooners, which had sailed the 15th, returned to port, not having been able to withstand the strong northwest wind and heavy sea. April 26 two schooners returned to port, having had their fore-mast heads carried away by strong northwest winds encountered about 40 miles off Point Tomales, California. The observer reports "These velocities are not considered dangerous to shipping."

At Fort Canby, Wash., a velocity of 25 miles per hour from the south, while light rain was falling, was recorded May 13; 32 miles from the south, with light rain, May 18. The observer reported that "Southerly gales are not considered dangerous on Columbia bar. The display of cautionary signals would have been of no benefit to shipping."

At Port Angeles, on April 14, a velocity of 30 miles per hour from the west, during clear weather, and on June 5, 28 miles from the northwest during clear weather, were recorded. The observer reports "No casualties reported," and his report of February 3, 1885, "In a great measure I do not think there have been any high winds here that could be considered dangerous to the shipping interests by what I have seen and learned from sea-faring men." In all of these cases, if signals had been displayed, they would have been of no value and would have unnecessarily delayed vessels, excepting some small coasting schooners.

I have not as yet been able to determine the danger velocities of winds for the several directions under different conditions of the weather at the various stations, but hope to do so before the stormy season commences.

Through the press, those having special interests to be protected from frost, rain, floods, &c., have been requested to inform me of the same, with the probable dates between which they desired warning, but I have not received any communications upon the subject. In the same manner I have requested those having records of observations of the temperature, direction and force of the wind, rainfall, snowfall, thunder storms, "northers," and destructive frosts, storms, and floods, to send me copies of the same, by months, for past years, and at the close of each month in future. I have to acknowledge the receipt of meteorological records from Mr. Charles W. Friend, Carson City, Nev.; Mr. Robert Hall, Sonoma, Cal.; Mr. H. C. Tower, Santa Mónica, Cal.; Mr. George A. Raymond, San Rafael, Cal.; Dr. W. W. Hayes and Sinsheimer

Bros., San Luis Obispo, Cal., through Corporal Thomas Gibson, Signal Corps, U. S. Army; Mr. Albert Dibblee, Fern Hill, near San Rafael, Cal.

Pursuant to instructions contained in your communication of March 19, 1885 (marked I), the Rev. W. H. Weinland was instructed in the duties of an observer. He sailed on May 19, 1885, on the schooner "Lizzie Merrill" for his station Mumtrekhlagamut, Alaska.

As per instructions contained in your communication of May 18, 1885 (marked K), Sergeant Nelson Gorom, Signal Corps, U. S. Army, is being instructed in the "indications" work of this office.

In this section the people are especially interested in the rainfall, on account of the effect of the same upon the growing crops. It is believed there are special interests that can be beneficially served.

All my spare time has been devoted to the following: Drawing isobars upon the charts for past years prepared at the office of the Chief Signal Officer for this office; copying data which I extracted from the records of the office of the Chief Signal Officer; making extracts from the Central Pacific Railroad Company's records, newspapers, vessel reports, and records of private individuals; placing available data into suitable shape for quick reference.

Letters received during the year	511
Letters written during the year	788
Monthly reports received from voluntary observers	41

I am, sir, very respectfully, your obedient servant,

ROBT. CRAIG,
First Lieutenant Fourth United States Artillery,
A. S. O. and Assistant In Charge.

The CHIEF SIGNAL OFFICER U. S. ARMY,
Washington, D. C.

A.

SPECIAL ORDERS, No. 1.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, January 2, 1885.

[Extract.]

* * * * * * *

5. By direction of the Secretary of War, First Lieutenant Robert Craig, Fourth Artillery, acting signal officer, is relieved from duty in this city, and will proceed via Yuma, Ariz., and Los Angeles, Cal., to San Francisco, Cal., and take station at that point, carrying out such instructions as he may receive from the Chief Signal Officer of the Army. The travel herein directed is necessary for the public service.

* * * * * * *

By command of Lieutenant-General Sheridan.

R. C. DRUM,
Adjutant-General.

B.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, January 6, 1885.

SIR: In carrying out the provisions of paragraph 5, Special Orders No. 1, Adjutant-General's Office, January 2, 1885, the Chief Signal Officer directs, that upon arrival at San Francisco, Cal., you will open a branch signal office for the service of the Pacific coast, and carefully study the whole field, making your office fully acquainted with the entire subject. You will determine what can be done to make the service most useful to the people of the Pacific coast, and render such service, in the way of indications, special predictions, signals, and otherwise as your facilities and means will permit; you will make monthly report to this office, showing, in general and detail, all that you may accomplish.

Very respectfully, yours,

B. M. PURSSELL,
Second Lieutenant, Signal Corps, U. S. Army.

First Lieut. ROBERT CRAIG,
Fourth Artillery, Acting Signal Officer and Assistant, Washington, D. C.

A true copy.

B. M. PURSSELL,
Second Lieutenant, Signal Corps, U. S. Army.

C.

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, January 2, 1885.

(Through the office of the Chief Signal Officer, U. S. A.)

SIR: The Secretary of War directs, as necessary to the interests of the service, that you proceed from San Francisco to Red Bluff, Cal., and return; from San Francisco to Monterey and Santa Cruz, Cal., and return, and from San Francisco to San Luis Obispo and Los Alamos, Cal., and return to San Francisco, carrying out such special instructions as you may receive from the Chief Signal Officer of the Army.

Very respectfully, your obedient servant,

R. C. DRUM,
Adjutant-General.

First Lieut. ROBERT CRAIG,
Fourth Artillery, Acting Signal Officer.

[1st indorsement.]

SIGNAL OFFICE, *Washington City, January 6, 1885.*

Respectfully transmitted to First Lieut. Robert Craig, Fourth Artillery, acting signal officer and assistant, Washington, D. C., who will carry out as per verbal instructions received by him from the Chief Signal Officer.

By order of the Chief Signal Officer:

B. M. PURSSELL,
Second Lieutenant, Signal Corps, U. S. Army.

A true copy.

B. M. PURSSELL,
Second Lieutenant, Signal Corps, U. S. Army.

D.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., January 10, 1885.

SIR: The Chief Signal Officer directs that upon your arrival at San Francisco you will at once take steps to recover and repair the sub-marine telegraph cable between the Presidio wharf and Alcatraz Island, recently reported broken by a ship's anchor.

In view of the small amount of money available for this work, you will request the division commander to furnish such assistance by the use of the quartermaster steamer and the labor of troops or prisoners as will reduce expenses to the lowest possible figure.

Such telegraph tools as are not on hand may be borrowed from the Western Union Telegraph Company at San Francisco, as was done on a similar occasion a year ago.

The services of one or more experts may be employed to superintend the recovery of the broken end of the cable and to make the splice; also such other necessary assistance and material as cannot be supplied by the military authorities; but before incurring any expenses you will obtain careful estimates of the probable cost of the entire work and telegraph them to this office for approval.

A sufficient quantity of spare cable is on the spot should it be found necessary to cut out and replace any weak or defective parts near the end of the cable.

The cable was originally laid from Fort Mason to Alcatraz Island, but, being broken by an anchor shortly afterward, was taken up and relaid from the Presidio wharf to the island. This was done by order of the division commander, and because it was thought that injury to the cable would thereafter be of rare occurrence, as vessels seldom anchor near that route.

No change in the present route will be made by you unless you are fully convinced from personal examination and careful inquiries of persons familiar with the locality that it will lessen the danger of injury to the cable; and not then until such change has been approved by the Chief Signal Officer.

A copy of a map showing the location of the cable and connections is inclosed for your information; also copies of telegrams referring to broken cable.

By order of the Chief Signal Officer.

Very respectfully,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

First Lieut. ROBERT CRAIG,
Fourth Artillery, A. S. O. and Assistant, Washington, D. C.

F.

SIGNAL SERVICE U. S. ARMY,
DIVISION OF THE PACIFIC,
San Francisco, Cal., Tuesday, June 30, 1885—9 p. m.*

Synopsis for the past 24 *hours.*

The barometer is about normal in the South Pacific, and slightly below in the Middle and North Pacific.

The temperature is about normal in all the districts.

The winds have been generally light to fresh and southerly in the South Pacific; light and variable in the North Pacific; variable in the Middle Pacific, with high northerly winds at Cape Mendocino.

Light local rains have fallen in the North Pacific; fair weather has continued in the Middle and South Pacific.

Indications for the succeeding 24 *hours.*

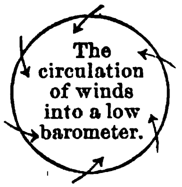
For the North Pacific, cloudy weather, local rains, light variable winds, generally northwesterly, stationary temperature along the coast and cooler over the interior.

For the Middle Pacific, fair weather, followed in northern part by local thunder storm, variable winds, generally southwesterly in southern part, nearly stationary temperature.

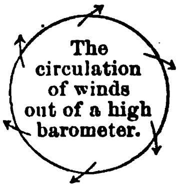
For the South Pacific, fair weather, variable winds, generally southwesterly, stationary temperature.

CRAIG.

G.



[Farmers' Bulletin. War Department, Office of the Chief Signal Officer, Division of Telegrams and Reports for the Benefit of Commerce and Agriculture.]



SAN FRANCISCO, CAL., *Thursday, May* 28, 1885—9 p. m.

Synopsis for the past 24 *hours.*

The barometer is slightly above the normal in Washington Territory, and slightly below in Oregon and California, being lowest over Northern California. The temperature is slightly above the normal in the South Pacific, from four to twenty degrees above in the Middle Pacific, and three to fifteen degrees above in the North Pacific. The winds have been variable; generally westerly in the South Pacific and southern part of the Middle Pacific, and northerly in the northern part of the Middle Pacific and southern part of the North Pacific. Fair weather has continued in all the Pacific districts, excepting light rain in the northwestern corner of Washington Territory.

Indications.

For the North Pacific, slightly warmer, generally fair weather, variable winds, generally northwesterly.

---

* Pacific time.

For the Middle Pacific, fair weather, variable winds, generally southwesterly over the southern part, nearly stationary temperature.

For the South Pacific, fair weather, variable, followed by westerly winds, nearly stationary temperature.

For the Middle Pacific coast region, during the month of May, winds blowing from the southeast to southwest are found to be the winds most likely to be followed by rain. Winds blowing from the north to east are found to be the winds least likely to be followed by rain.

General laws accompanying weather changes in the United States.—Weather changes affecting the locality in which this bulletin is posted generally appear first to the westward. An area of low barometer (storm-center) generally moves slightly to the north of east; an area of high barometer generally moves slightly to the south of east. In advance of the low barometer are generally found rain-winds and increasing cloudiness, with rain or snow; in rear of a low barometer are generally found colder, dry winds and clearing weather.

Meteorological summary for the month of May.

Mean barometer, corrected for temperature and instrumental error, only	29.944
Mean barometer, reduced to sea-level	30.014
Mean monthly range of barometer	0.380
Mean temperature	56°.2
Highest temperature (in 1883)	86°.0
Lowest temperature (in 1876, '79, '80, and '82)	45°.0
Mean monthly range of temperature	30°.8
Average precipitation ... inch	0.68
Prevailing wind	West.

Published by co-operation of the War and Post-Office Departments.

W. B. HAZEN,
Chief Signal Officer.

H.

LIST OF PAPERS, ETC., RECEIVING THE SYNOPSES AND INDICATIONS.

1 *p. m.*—1 for file; 1 for office Chief Signal Officer; 1 for Associated Press (Pacific Coast, M. A. Richardson, agent); 1 for The Evening Bulletin; 1 for The Evening Post; 1 for The Daily Report; 1 for Die Abend Post; 1 for Western Union Telegraph Office (posted in office).

9 *p. m.*—1 for file; 1 for office Chief Signal Officer; 1 for Associated Press; 1 for The Chronicle; 1 for The Call; 1 for The Alta; 1 for The Examiner; 1 for Le Courrier de San Francisco; 1 for Der Demokrat; 1 for Western Union Telegraph Office (posted in office); 1 for The Commercial News; 1 for the Observer Signal Corps, San Francisco.

J.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, March 19, 1885.

SIR: I am directed by the Acting Chief Signal Officer to inform you that a station of the second order has been ordered established at Mumtrekhlagamut, Alaska, of which Rev. William H. Weinland will have charge.

Mr. Weinland, who expects to be in San Francisco about the 1st of April, has been requested to call upon you for instruction in the manner of reading our instruments and recording observations, and I have the honor to request that you will satisfy yourself that he has been sufficiently instructed and has a thorough understanding of all the duties of an observer, before he leaves for his station.

Mr. Weinland has also been requested to compare his barometers with yours, to insure this office that they have not been injured in their transit to San Francisco.

Very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

Lieut. ROBERT CRAIG,
Acting Signal Officer and Assistant,
Merchants' Exchange, San Francisco, Cal.

K.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, May 18, 1885.

SIR: The Chief Signal Officer directs that you carefully instruct one of the enlisted men on duty at your station in the "indications" work, so that at any time when it may become necessary for you to leave the station on inspection trip, or for other reasons, the "indications" will be made by this man during your temporary absence.

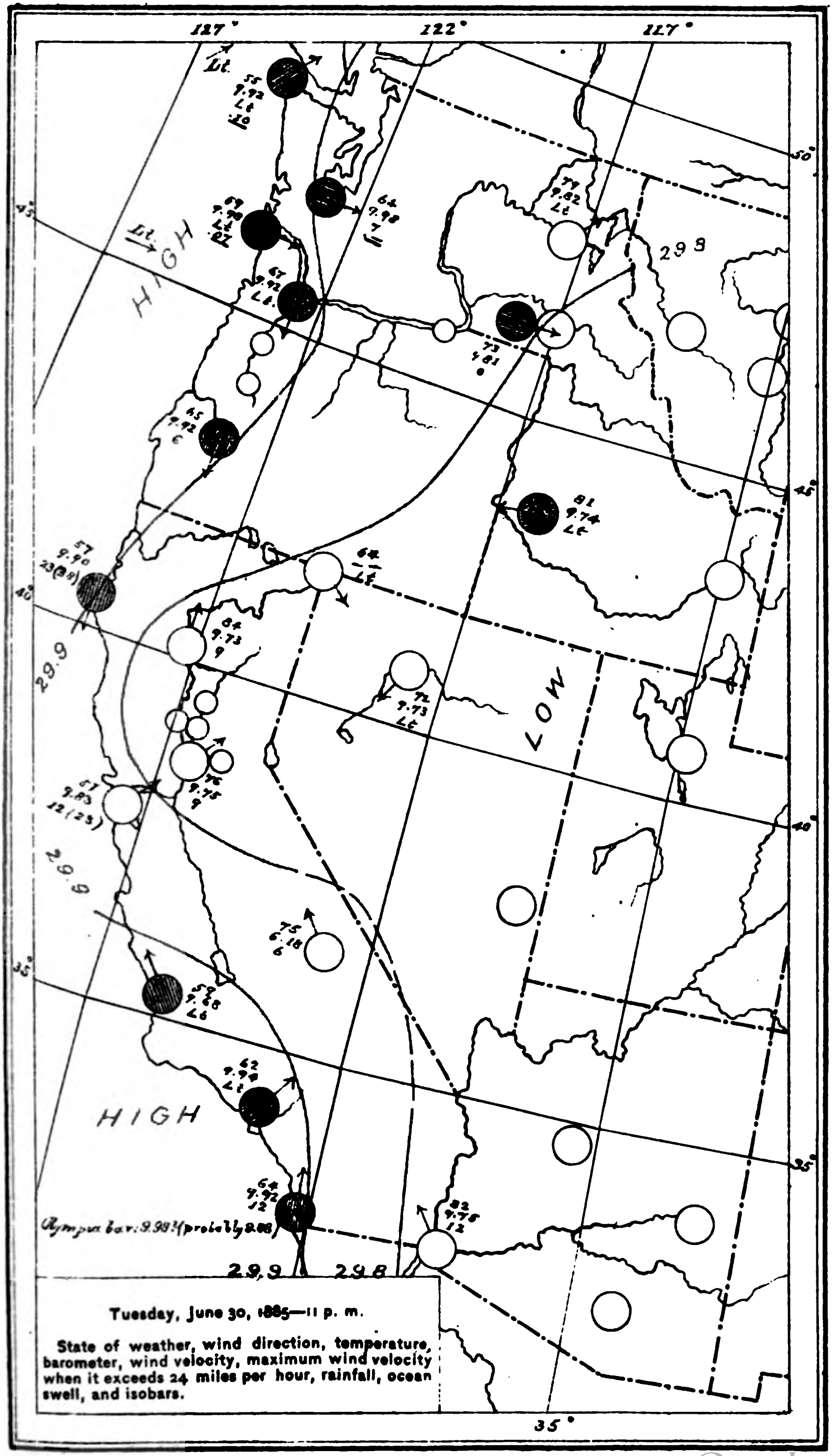
Very respectfully, your obedient servant,

B. M. PURSSELL,
Second Lieutenant, Signal Corps, U. S. Army.

First Lieut. ROBERT CRAIG,
Acting Signal Officer and Assistant,
San Francisco, Cal.

WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106 a.

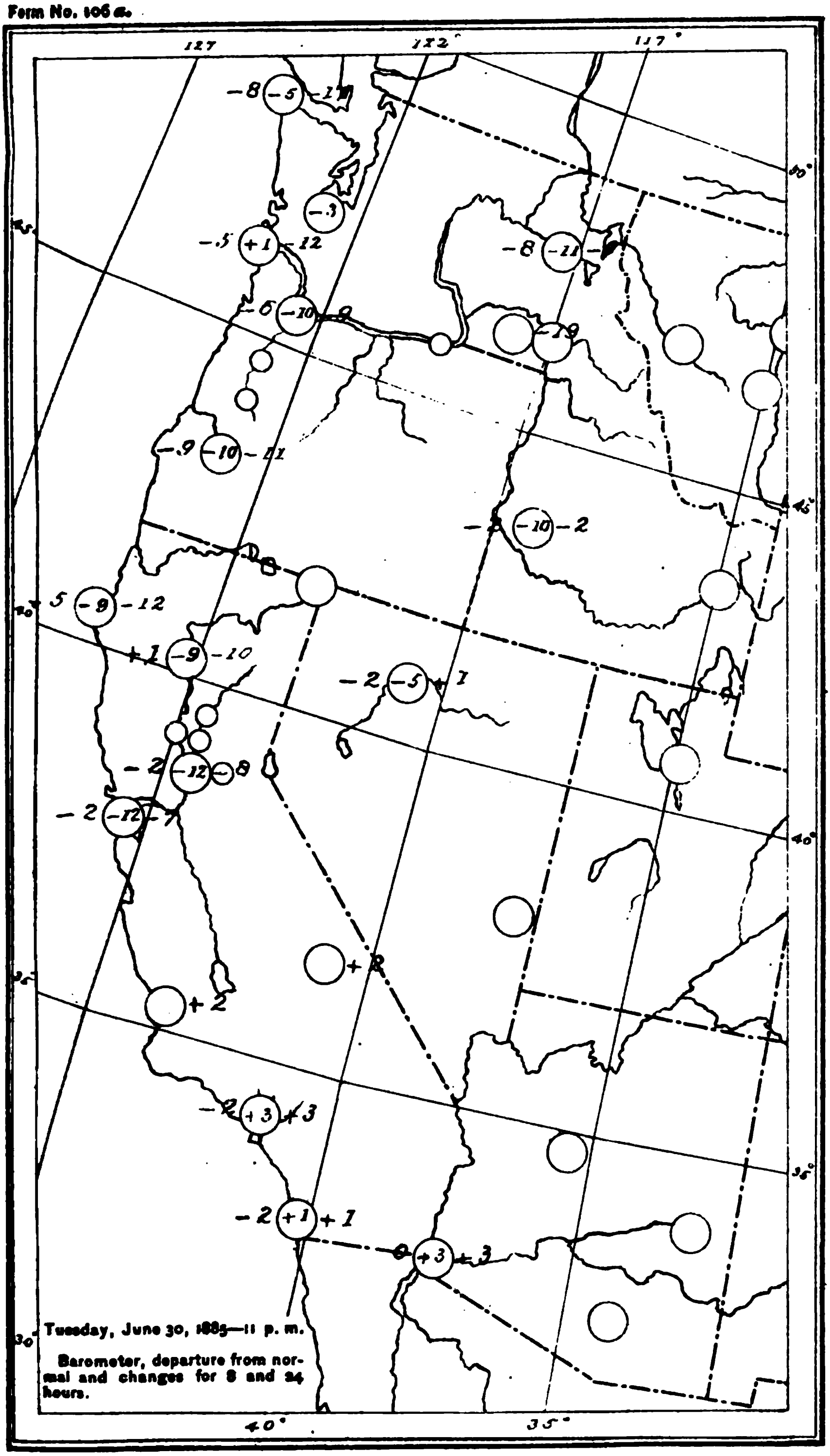


Tuesday, June 30, 1885—11 p. m.

State of weather, wind direction, temperature, barometer, wind velocity, maximum wind velocity when it exceeds 24 miles per hour, rainfall, ocean swell, and isobars.

WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106 a.

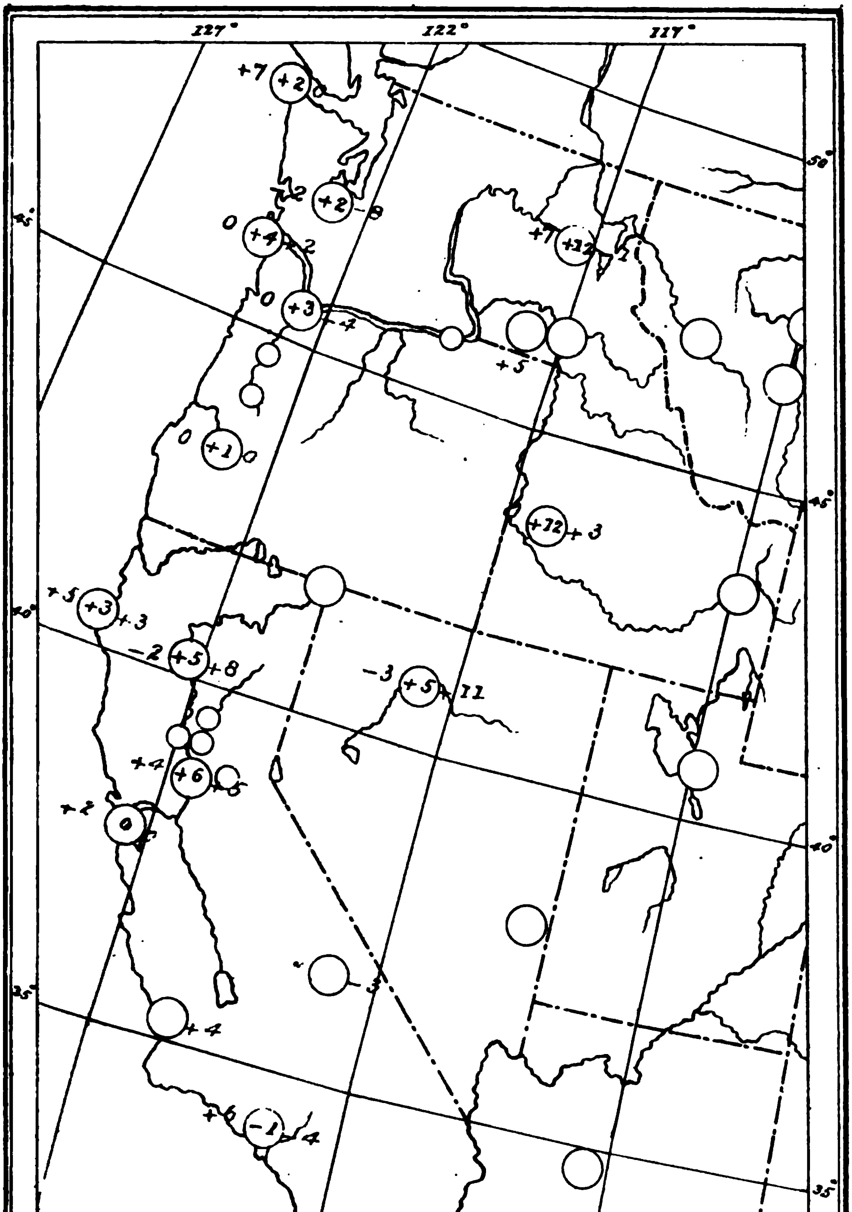


Tuesday, June 30, 1885—11 p. m.

Barometer, departure from normal and changes for 8 and 24 hours.

WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106 a.

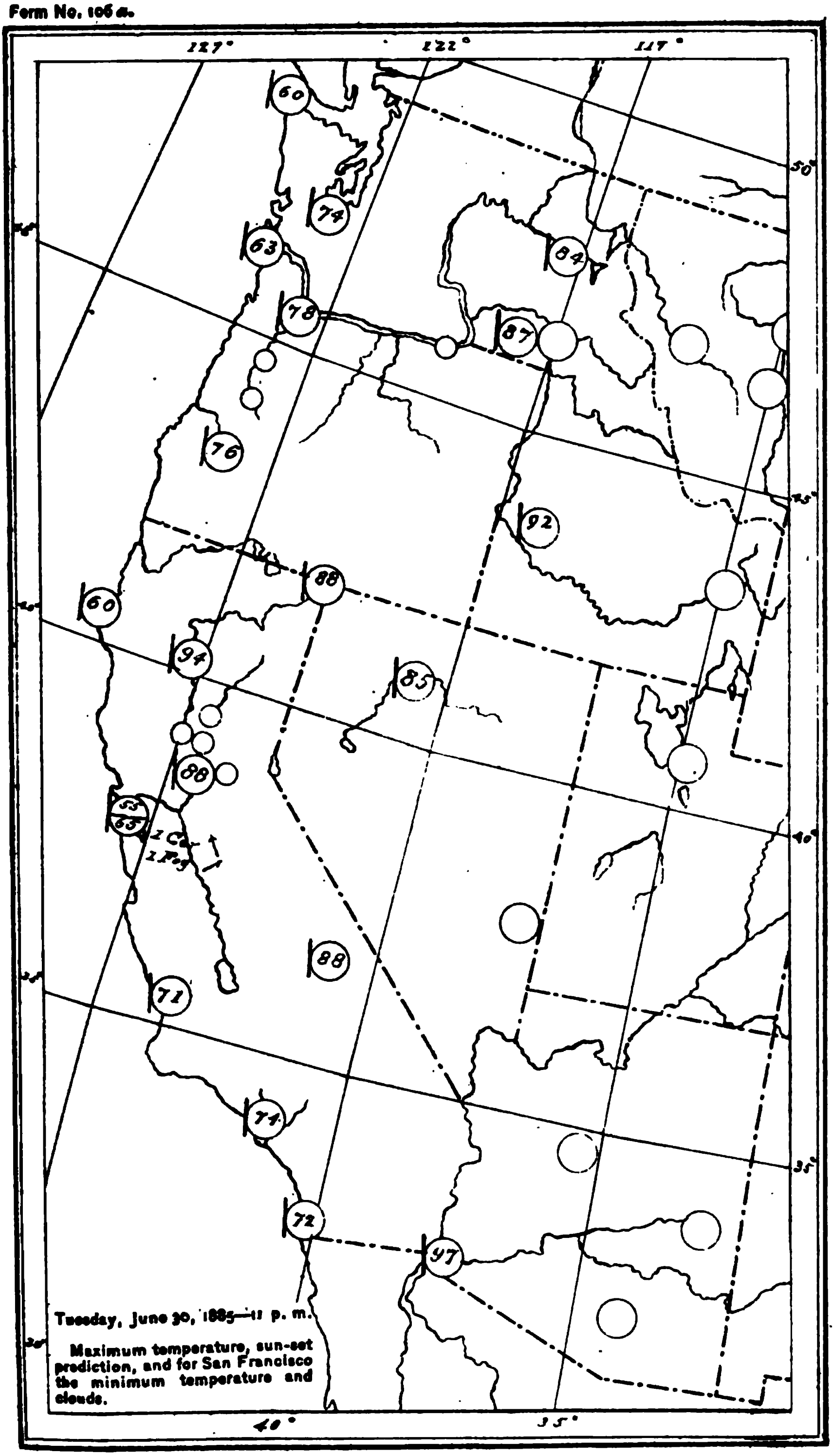


Tuesday, June 30, 1885—11 p. m.

Temperature, departure from normal and changes of 8 and 24 hours.

WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106 a.



Tuesday, June 30, 1885—11 p. m.

Maximum temperature, sun-set prediction, and for San Francisco the minimum temperature and clouds.

APPENDIX 4.

REPORT OF THE STATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have the honor to report, in outline, the nature of the work performed by the Stations Division during the year ending this day.

The duties of this division are as varied and extensive as they are important, and their increase has been commensurate with the rapid strides taken by the service in meeting the wants of the people for a wider dissemination of the weather reports, weather signals, and information to be obtained only from the records of this office.

This division has general supervision of all paid observers of the Signal Service; of all special cautionary and cold-wave display stations; of the railway weather bulletins; of the instruction of enlisted men of the Signal Corps; of inspectors of the Signal Service, and of the receipt, record, and publication of reports from the above sources.

All correspondence with the enlisted men and civilians on duty at stations in relation to matters connected with their official duties as observers or displaymen is under the supervision of this division.

All directions to stations relative to changes of instruments or elevation of instruments, changes in instrumental corrections or reduction constants, otherwise than by general orders, are issued by this division.

All meteorological records from paid observers are here filed, and in case of destruction of the meteorological records of any station, by fire or otherwise, duplicate copies of those on file at this office are made and sent to the station in question.

The original records of observations, the monthly meteorological summaries, and other meteorological forms received from observers at stations, from displaymen, special river and special cotton-region observers, are here carefully examined for errors and irregularities, the necessary corrections applied, and after final action are filed in the division.

In all matters relating to the meteorological work of the various stations, their establishment, removal, or discontinuance, special instructions are issued and the necessary action taken.

The regular stations of the service displaying cautionary signals and the special display stations have continued in successful operation.

Signals on Lake Superior were discontinued on December 1, and on Lakes Michigan, Huron, Saint Clair, Erie, and Ontario on December 15, 1884.

The very limited balance of the appropriation available for the purpose, made it necessary to delay the opening of the special stations on the lakes until April 15, 1885; but, owing to the backwardness of the spring, the date named proved to be early enough for lake interests.

The number of stations remains about as last year, the appropriation being too small to display signals at any of the many additional points asked for by parties prominently interested in lake navigation.

During the year all of the special display stations have been inspected, and the reports of the inspectors were very generally satisfactory.

Requests from shipping-men for the resumption of night services of operators have been general, but there being no money for the purpose, the service could not take favorable action in the matter. At present night signals for special display stations are filed in the telegraph office by the observers in charge of the centers, for transmission to the displaymen the following morning.

The river and flood service has continued in active operation. It has been a source of great benefit to river interests generally, and the results of the large increase in the number of observations taken and reports made have been very gratifying.

Centers have been established, at which the river reports from special stations have been gathered in times of danger from flood, and rapidly disseminated through the sections of adjacent country liable to overflow, thus being the means of saving much valuable property and perhaps a number of lives.

My report on this subject explains the whole system of river and flood reports, and indicates how it has been extended and simplified during the year.

During the coming year it is expected that river gauges will be located, observers appointed, and observations commenced at many important points which the insufficient appropriations have heretofore prevented being done.

In the cotton-region system of reports, but few changes from last year have been made. Much pressure has been brought to bear on this office to open new stations at important points in the cotton-belt, but, as will be seen from my report on this subject, the meagerness of the appropriation for this branch of the service would not permit of any expenditures in this direction. On the contrary, observations were not begun until May 1 this year, in order that the money might be husbanded to operate this important service up to the end of the fiscal year, to avoid discontinuing any of the stations.

With a liberal sum from Congress for this work, the reports and their resulting advantages to all cotton interests could be extended indefinitely.

The cold-wave signal is a recent feature of this service; but one which at once made its way into public favor.

The first few warnings of approaching cold waves were received by the business community with such marked approval that this signal has become very popular, and all agricultural, commercial, and industrial interests are anxious to obtain the information of approaching cold weather.

My report on this signal shows what advancement has been made, and how the wants of the people for these reports have been met by the Signal Service; and also the gratifying results of the system.

With a limited appropriation for the purpose, much good could be accomplished, and many important centers of population furnished with cold-wave warnings which have of necessity been left untouched.

In my report on the railway weather bulletin service for the year, it will be seen that much good has been accomplished in the way of furnishing the weather predictions to the railroads of the country for transmission to, and display at, stations on their roads, in the interests of the traveling public and the resident population at the many hundreds of offices reached.

This railway service has been considerably extended during the year, so that fifty-one roads now post the daily weather reports at their various offices.

These reports are growing in favor, and are found to be very valuable in making shipments, moving freight, &c.

It is expected that during the ensuing year other roads will adopt this system, and that finally every railroad in the country will see the advantages to be derived from the weather forecasts furnished by this office.

Considerable has been done in the way of displaying weather and temperature signals from railroad trains. A number of roads have obtained flags or symbols, and are co-operating with this service in publishing the weather reports. On some roads the signals or symbols are displayed from the baggage-cars, and on others at the stations on the road. The indications are telegraphed to the superintendent, or other official charged with the work, and under his direction the proper symbols are displayed.

It is expected that a majority of the railroads of the country will rapidly adopt this system, which is so simple and inexpensive, the reports being sent from this office at the cost of the Signal Service.

In addition to the 49 regular appendices of the Annual Report of the Chief Signal Officer, meteorological data and tables have been compiled in the Stations Division, occupying time equal to the labor of one man for 966 working hours. These data have been for use in courts, for publication, for use of merchants' exchanges and boards of trade, for the Mississippi River Commission, for use of railroads, State boards of health, State weather services, and scientific purposes generally.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

THE CHIEF SIGNAL OFFICER OF THE ARMY,
Washington City.

APPENDIX 5.

No. 5.—*Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, United States Army, for each month and the year. (Compiled from January, 1880, to December, 1884, inclusive, except at stations opened subsequent to the former date, with monthly constants for the reduction to sea-level of barometric observations made at Signal-Service stations.)*

[Obtained by dividing the sum of the 7 a. m., 3, and 11 p. m. (Washington time), normals by three.]

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
		Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
New England:														
Eastport, Me	Apr. 1, 1873	29.975	29.978	29.807	29.782	29.916	29.844	29.815	29.913	29.962	29.988	29.970	29.916	29.906
Portland, Me	Jan. 15, 1871	30.031	30.027	29.854	29.831	29.928	29.877	29.841	29.947	29.994	30.033	30.024	29.974	29.947
Mount Washington, N. H	Dec. 1, 1870	23.432	23.465	23.366	23.498	23.736	23.818	23.833	23.927	23.889	23.767	23.584	23.457	23.647
Boston, Mass.	Nov. 1, 1870	29.975	29.972	29.790	29.776	29.803	29.823	29.704	29.895	29.933	29.977	29.975	29.918	29.891
Block Island, R. I	Sept. 1, 1880	30.086	30.113	29.891	29.882	29.969	29.944	29.910	30.005	30.042	30.093	30.100	30.042	30.006
New Haven, Conn	Dec. 10, 1872	30.018	30.019	29.837	29.822	29.888	29.853	29.830	29.925	29.954	30.005	30.020	29.967	29.928
New London, Conn	Jan. 10, 1871	30.094	30.096	29.907	29.893	29.972	29.932	29.908	30.003	30.034	30.086	30.099	30.048	30.006
Middle Atlantic States:														
Albany, N. Y	Dec. 22, 1873	30.064	30.052	29.886	29.856	29.904	29.870	29.846	29.944	29.982	30.038	30.052	30.011	29.959
New York City	Nov. 1, 1870	29.979	29.977	29.798	29.781	29.840	29.808	29.791	29.880	29.910	29.961	29.981	29.930	29.886
Philadelphia, Pa	Jan. 1, 1871	30.051	30.045	29.870	29.848	29.890	29.864	29.850	29.934	29.960	30.022	30.057	30.008	29.951
Atlantic City, N. J	Dec. 10, 1873	30.145	30.143	29.960	29.949	29.999	29.966	29.948	30.030	30.059	30.114	30.151	30.101	30.047
Barnegat City, N. J	Dec. 10, 1873	30.130	30.131	29.949	29.937	29.988	29.953	29.933	30.019	30.047	30.102	30.135	30.086	30.034
Cape May, N. J	May 24, 1871	30.128	30.131	29.944	29.939	29.974	29.943	29.936	30.014	30.041	30.096	30.130	30.097	30.032
Sandy Hook, N. J	Dec. 10, 1873	30.128	30.125	29.943	29.930	29.982	29.948	29.920	30.016	30.047	30.106	30.134	30.084	30.030
Delaware Breakwater, Del	Jan. 28, 1880	30.166	30.146	29.968	29.957	29.998	29.960	29.953	30.026	30.055	30.108	30.152	30.107	30.050
Baltimore, Md	Jan. 1, 1871	30.146	30.139	29.971	29.954	29.986	29.950	29.938	30.011	30.042	30.105	30.150	30.106	30.042
Washington City	Nov. 1, 1870	30.077	30.067	29.905	29.885	29.915	29.884	29.879	29.950	29.982	30.030	30.084	30.042	29.976
Cape Henry, Va	Dec. 15, 1873	30.158	30.163	29.989	29.974	30.012	29.976	29.974	30.025	30.061	30.114	30.168	30.128	30.062
Chincoteague, Va	Mar. 16, 1880	30.156	30.169	29.973	29.975	30.011	29.977	29.971	30.034	30.065	30.119	30.165	30.127	30.061
Lynchburg, Va	May 24, 1871	29.462	29.459	29.307	29.300	29.339	29.318	29.323	29.371	29.403	29.449	29.484	29.435	29.388
Norfolk, Va	Jan. 1, 1871	30.146	30.151	29.975	29.961	30.000	29.968	29.967	30.014	30.048	30.103	30.153	30.117	30.050
South Atlantic States:														
Charlotte, N. C	Oct. 6, 1878	29.296	29.303	29.157	29.153	29.181	29.167	29.176	29.202	29.239	29.280	29.318	29.277	29.229
Hatteras, N. C	Dec. 1, 1880	30.156	30.175	29.998	29.996	30.032	29.998	30.001	30.029	30.064	30.102	30.156	30.128	30.070
Kitty Hawk, N. C	Jan. 15, 1875	30.183	30.192	30.021	30.013	30.051	30.017	30.014	30.055	30.088	30.130	30.180	30.144	30.091
Macon, Fort, N. C	May 23, 1878	30.163	30.180	30.013	30.005	30.033	30.004	30.005	30.027	30.063	30.105	30.159	30.137	30.075
Smithville, N. C	Oct. 15, 1875	30.148	30.165	30.004	29.991	30.016	29.992	29.995	30.007	30.043	30.086	30.143	30.125	30.060
Wilmington, N. C	Jan. 1, 1871	30.122	30.134	29.972	29.958	29.985	29.959	29.964	29.985	30.019	30.068	30.121	30.098	30.032
Charleston, S. C	Jan. 5, 1871	30.128	30.134	29.991	29.970	29.987	29.968	29.971	29.980	30.010	30.052	30.114	30.099	30.034
Augusta, Ga	Nov. 2, 1870	30.020	30.018	29.880	29.855	29.865	29.849	29.855	29.860	29.908	29.956	30.021	29.980	29.923
Savannah, Ga	Jan. 1, 1871	30.099	30.108	29.973	29.947	29.964	29.944	29.950	29.949	29.978	30.019	30.080	30.073	30.008
Jacksonville, Fla	Sept. 11, 1871	30.142	30.146	30.036	29.995	29.993	29.996	30.013	29.990	30.009	30.036	30.110	30.114	30.048

No. 5.—*Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, &c.*—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Florida Peninsula:		*Inches.*	*Inches.*	*Inches.*	*Inches*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Cedar Keys, Fla	Nov. 7, 1879	30.155	30.158	30.075	30.033	30.007	30.019	30.046	30.005	30.017	30.038	30.114	30.128	30.066
Key West, Fla	Nov. 1, 1870	30.115	30.124	30.075	30.043	29.987	30.023	30.058	30.000	29.977	29.976	30.046	30.093	30.043
Sanford, Fla	Sept. 1, 1882	30.155	30.068	30.031	29.936	29.958	29.962	29.991	29.966	29.961	29.994	30.048	30.094	30.014
Eastern Gulf States:														
Atlanta, Ga	Sept. 25, 1878	28.982	28.986	28.868	28.854	28.877	28.876	28.895	28.907	28.926	28.958	28.998	28.965	28.924
Pensacola, Fla	Oct. 27, 1879	30.154	30.144	30.052	30.006	29.992	29.989	30.022	29.980	30.010	30.045	30.130	30.124	30.055
Mobile, Ala	Nov. 7, 1870	30.140	30.127	30.030	29.996	29.958	29.957	30.020	29.986	30.005	30.039	30.140	30.119	30.043
Montgomery, Ala	Nov. 9, 1870	29.953	29.941	29.832	29.797	29.801	29.788	29.813	29.800	29.830	29.870	29.953	29.931	29.859
Vicksburg, Miss	Sept. 10, 1871	29.920	29.892	29.805	29.759	29.754	29.761	29.800	29.780	29.805	29.838	29.930	29.902	29.829
New Orleans, La	Nov. 1, 1870	30.099	30.083	30.002	29.953	29.941	29.945	29.986	29.951	29.966	29.998	30.087	30.079	30.008
Western Gulf States:														
Shreveport, La	Sept. 3, 1871	29.927	29.885	29.807	29.743	29.740	29.755	29.793	29.784	29.807	29.834	29.933	29.905	29.826
Fort Smith, Ark	June 1, 1882	29.736	29.682	29.550	29.448	29.483	29.487	29.527	29.560	29.561	29.583	29.680	29.620	29.576
Little Rock, Ark	July 1, 1879	29.842	29.805	29.715	29.654	29.658	29.655	29.700	29.702	29.726	29.757	29.857	29.827	29.742
Galveston, Tex	Apr. 19, 1871	30.104	30.079	30.000	29.941	29.927	29.942	29.990	29.963	29.969	30.003	30.096	30.082	30.008
Indianola, Tex	May 1, 1872	30.119	30.074	29.997	29.935	29.923	29.938	29.991	29.965	29.969	30.008	30.107	30.096	30.010
Palestine, Tex	Dec. 3, 1881	29.666	29.561	29.506	29.417	29.441	29.453	29.497	29.502	29.503	29.510	29.607	29.565	29.521
Rio Grande Valley:														
Brownsville, Tex	Aug. 25, 1875	30.072	30.032	29.942	29.873	29.866	29.889	29.939	29.915	29.917	29.946	30.050	30.042	29.957
Rio Grande City, Tex	May 28, 1875	29.914	29.847	29.782	29.719	29.694	29.721	29.753	29.747	29.700	29.826	29.927	29.904	29.800
Ohio Valley and Tennessee:														
Chattanooga, Tenn	Jan. 8, 1879	29.355	29.344	29.226	29.203	29.224	29.217	29.240	29.247	29.277	29.314	29.373	29.339	29.280
Knoxville, Tenn	Jan. 1, 1871	29.136	29.128	29.015	28.995	29.022	29.018	29.045	29.055	29.086	29.117	29.165	29.125	29.076
Memphis, Tenn	Feb. 28, 1871	29.831	29.801	29.703	29.650	29.652	29.650	29.701	29.697	29.730	29.760	29.845	29.812	29.736
Nashville, Tenn	Nov. 1, 1870	29.581	29.555	29.451	29.414	29.420	29.409	29.454	29.448	29.493	29.524	29.594	29.562	29.492
Louisville, Ky	Sept. 11, 1871	29.556	29.536	29.423	29.402	29.419	29.403	29.442	29.457	29.487	29.523	29.582	29.550	29.482
Indianapolis, Ind	Feb. 10, 1871	29.298	29.274	29.182	29.157	29.177	29.161	29.206	29.237	29.256	29.285	29.320	29.291	29.237
Cincinnati, Ohio	Nov. 1, 1870	29.493	29.446	29.367	29.341	29.358	29.340	29.374	29.402	29.429	29.464	29.516	29.478	29.417
Columbus, Ohio	July 1, 1878	29.262	29.245	29.137	29.117	29.146	29.129	29.158	29.198	29.224	29.255	29.283	29.243	29.200
Pittsburg, Pa	Nov. 1, 1870	29.302	29.295	29.172	29.156	29.168	29.174	29.193	29.245	29.275	29.305	29.326	29.282	29.243
Lower Lakes:														
Buffalo, N. Y	Nov. 1, 1870	29.328	29.323	29.217	29.206	29.237	29.219	29.218	29.291	29.317	29.348	29.328	29.281	29.276
Oswego, N. Y	Nov. 1, 1870	29.744	29.737	29.614	29.594	29.627	29.604	29.578	29.671	29.697	29.740	29.783	29.694	29.690
Rochester, N. Y	Nov. 1, 1870	29.410	29.410	29.303	29.284	29.319	29.309	29.274	29.358	29.389	29.428	29.428	29.387	29.358
Erie, Pa	May 25, 1873	29.350	29.352	29.244	29.237	29.264	29.244	29.253	29.312	29.335	29.361	29.364	29.326	29.304
Cleveland, Ohio	Nov. 1, 1870	29.362	29.348	29.250	29.239	29.258	29.241	29.263	29.317	29.338	29.365	29.378	29.342	29.308
Sandusky, Ohio	Aug. 2, 1877	29.419	29.402	29.308	29.294	29.321	29.305	29.308	29.368	29.381	29.414	29.429	29.398	29.362
Toledo, Ohio	Nov. 1, 1870	29.392	29.375	29.286	29.260	29.278	29.266	29.284	29.337	29.356	29.386	29.402	29.374	29.333
Detroit, Mich	Nov. 1, 1870	29.373	29.363	29.277	29.263	29.274	29.264	29.275	29.334	29.350	29.370	29.382	29.351	29.323

Upper Lakes:														
Alpena, Mich	Sept. 10, 1872	29.371	29.375	29.330	29.316	29.321	29.290	29.291	29.303	29.365	29.392	29.362	29.387	29.348
Escanaba, Mich	May 24, 1871	29.306	29.368	29.332	29.314	29.302	29.270	29.281	29.346	29.332	29.359	29.347	29.342	29.330
Grand Haven, Mich	May 24, 1871	29.302	29.377	29.319	29.300	29.300	29.281	29.313	29.362	29.364	29.390	29.388	29.369	29.347
Mackinaw City, Mich	Aug. 20, 1882	29.369	29.420	29.344	29.318	29.277	29.328	29.256	29.359	29.302	29.391	29.358	29.342	29.346
Marquette, Mich	May 1, 1871	29.284	29.301	29.279	29.255	29.252	29.219	29.226	29.291	29.266	29.290	29.278	29.269	29.267
Port Huron, Mich	July 25, 1874	29.383	29.371	29.202	29.283	29.305	29.274	29.282	29.344	29.365	29.396	29.391	29.356	29.337
Chicago, Ill	Nov. 1, 1870	29.374	29.356	29.285	29.256	29.261	29.242	29.281	29.321	29.325	29.357	29.378	29.359	29.316
Milwaukee, Wis	Nov. 1, 1870	29.312	29.204	29.241	29.219	29.218	29.197	29.231	29.278	29.274	29.299	29.311	29.295	29.264
Duluth, Minn	Nov. 1, 1870	29.321	29.312	29.292	29.260	29.240	29.212	29.241	29.289	29.241	29.276	29.299	29.321	29.275
Upper Mississippi Valley:														
Saint Paul, Minn	Nov. 1, 1870	29.185	29.169	29.136	29.083	29.076	29.055	29.099	29.128	29.107	29.140	29.172	29.190	29.128
La Crosse, Wis	Oct. 15, 1872	29.290	29.271	29.225	29.174	29.164	29.149	29.187	29.230	29.218	29.254	29.278	29.287	29.227
Davenport, Iowa	May 24, 1871	29.452	29.417	29.352	29.299	29.304	29.283	29.336	29.369	29.368	29.401	29.447	29.487	29.372
Des Moines, Iowa	Aug. 1, 1878	29.211	29.179	29.121	29.050	29.055	29.039	29.104	29.129	29.111	29.148	29.201	29.208	29.129
Dubuque, Iowa	July 10, 1873	29.373	29.353	29.294	29.244	29.246	29.228	29.277	29.315	29.307	29.340	29.374	29.372	29.310
Keokuk, Iowa	July 10, 1871	29.456	29.419	29.349	29.284	29.291	29.275	29.336	29.360	29.361	29.400	29.455	29.443	29.369
Cairo, Ill	June 1, 1871	29.800	29.761	29.666	29.612	29.619	29.609	29.656	29.662	29.693	29.727	29.808	29.780	29.699
Springfield, Ill	July 1, 1879	29.448	29.419	29.332	29.291	29.303	29.284	29.334	29.362	29.370	29.407	29.455	29.436	29.370
Saint Louis, Mo	Nov. 1, 1870	29.540	29.499	29.415	29.360	29.371	29.359	29.412	29.429	29.441	29.481	29.549	29.517	29.448
Missouri Valley:														
Leavenworth, Kans	May 21, 1871	29.245	29.211	29.137	29.060	29.068	29.056	29.124	29.144	29.134	29.170	29.247	29.235	29.158
Omaha, Nebr	Nov. 1, 1870	28.958	28.912	28.856	28.775	28.781	28.708	28.842	28.866	28.844	28.879	28.944	28.941	28.862
Bennett, Fort, Dak	Dec. 22, 1879	28.478	28.478	28.431	28.370	28.349	28.301	28.312	28.352	28.370	28.394	28.467	28.476	28.401
Huron, Dak	July 1, 1881	28.696	28.685	28.636	28.555	28.561	28.542	28.586	28.598	28.575	28.600	28.659	28.678	28.614
Yankton, Dak	Apr. 1, 1873	28.777	28.769	28.720	28.643	28.637	28.621	28.688	28.702	28.681	28.711	28.784	28.795	28.711
Extreme Northwest:														
Moorhead, Minn	Jan. 1, 1881	29.103	29.078	29.038	28.995	28.961	28.909	28.950	28.973	28.959	28.988	29.086	29.067	29.005
Saint Vincent, Minn	Sept. 5, 1880	29.242	29.221	29.196	29.161	29.113	29.041	29.067	29.098	29.070	29.117	29.182	29.203	29.143
Bismarck, Dak	Sept. 15, 1874	28.192	28.189	28.188	28.152	28.109	28.080	28.151	28.167	28.149	28.160	28.222	28.228	28.166
Buford, Fort, Dak	Oct. 23, 1878	27.970	27.965	27.961	27.928	27.902	27.864	27.924	27.936	27.935	27.927	28.002	28.008	27.942
Northern Slope:														
Assinaboine, Fort, Mont	Oct. 6, 1879	27.167	27.150	27.133	27.105	27.118	27.089	27.147	27.160	27.140	27.113	27.200	27.167	27.141
Benton, Fort, Mont	Oct. 11, 1879	27.233	27.209	27.185	27.151	27.174	27.126	27.161	27.170	27.207	27.196	27.269	27.230	27.193
Custer, Fort, Mont	Dec. 5, 1878	26.787	26.774	26.776	26.780	26.778	26.748	26.818	26.829	26.834	26.818	26.895	26.854	26.808
Helena, Mont	Oct. 15, 1879	25.833	25.811	25.800	25.780	25.813	25.802	25.881	25.879	25.863	25.831	25.897	25.829	25.835
Maginnis, Fort, Mont	July 14, 1882	25.500	25.504	25.513	25.479	25.557	25.562	25.632	25.653	25.505	25.493	25.551	25.509	25.546
Shaw, Fort, Mont	Apr. 1, 1880	26.346	26.328	26.328	26.285	26.312	26.292	26.369	26.377	26.376	26.348	26.406	26.347	26.343
Deadwood, Dak	Dec. 25, 1877	25.238	25.257	25.274	25.286	25.334	25.350	25.434	25.440	25.391	25.351	25.363	25.299	25.335
Cheyenne, Wyo	Nov 1, 1870	23.888	23.898	23.908	23.918	23.985	24.044	24.120	24.136	24.076	24.016	24.013	23.930	23.995
North Platte, Nebr	Sept. 18, 1874	27.082	27.080	27.037	26.996	27.019	27.022	27.097	27.112	27.081	27.085	27.140	27.107	27.072
Middle Slope:														
Denver, Colo	Nov. 19, 1871	24.661	24.664	24.653	24.647	24.693	24.723	24.820	24.835	24.794	24.747	24.782	24.702	24.727
Pike's Peak, Colo	Nov. 1, 1873	17.489	17.505	17.567	17.635	17.778	17.961	18.080	18.077	17.960	17.797	17.675	17.580	17.759
West Las Animas, Colo	Oct. 1, 1881	26.047	26.015	25.970	25.912	25.973	26.021	26.065	26.101	26.058	26.011	26.092	26.018	26.023
Dodge City, Kans	Sept. 15, 1874	27.437	27.423	27.361	27.310	27.334	27.337	27.413	27.445	27.410	27.421	27.486	27.447	27.402
Elliott, Fort, Tex	Nov. 29, 1879	27.279	27.261	27.223	27.167	27.175	27.181	27.258	27.280	27.278	27.274	27.324	27.278	27.248
Southern Slope:														
Sill, Fort, Ind. T	June 23, 1875	28.850	28.853	28.777	28.699	28.693	28.690	28.763	28.770	28.783	28.815	28.907	28.863	28.789
Concho, Fort, Tex	Oct. 10, 1875	28.190	28.159	28.090	28.033	28.020	28.045	28.097	28.111	28.121	28.131	28.206	28.179	28.115
Davis, Fort, Tex	Dec. 24, 1877	25.185	25.180	25.143	25.141	25.145	25.187	25.242	25.250	25.243	25.157	25.259	25.215	25.196
Stockton, Fort, Tex	Feb. 26, 1876	27.042	27.014	26.964	26.923	26.899	26.922	26.985	27.004	27.012	27.012	27.078	27.044	26.991

No. 5.—*Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, &c.*—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
		Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Southern Plateau:														
El Paso, Tex	Nov. 5, 1877	26.290	26.261	26.224	26.192	26.160	26.186	26.249	26.265	26.270	26.262	26.321	26.303	26.248
Apache, Fort, Ariz	Oct. 9, 1877	25.026	25.009	24.994	24.972	24.966	25.005	25.067	25.073	25.055	25.081	25.058	25.045	25.025
Grant, Fort, Ariz	Nov. 1, 1875	25.228	25.216	25.170	25.167	25.164	25.203	25.245	25.241	25.257	25.234	25.256	25.238	25.219
Prescott, Ariz	Nov. 19, 1873	24.717	24.703	24.672	24.659	24.669	24.714	24.798	24.785	24.758	24.730	24.755	24.728	24.724
Thomas, Camp, Ariz	Sept. 22, 1877	27.307	27.271	27.226	27.163	27.138	27.134	27.192	27.184	27.192	27.221	27.297	27.302	27.219
Yuma, Ariz	Nov. 18, 1873	29.939	29.913	29.827	29.760	29.673	29.623	29.653	29.647	29.664	29.754	29.862	29.876	29.766
Middle Plateau:														
Winnemucca, Nev.[1]	July 1, 1877	25.644	25.633	25.598	25.528	25.552	25.549	25.608	25.573	25.608	25.627	25.723	25.642	25.607
Salt Lake City, Utah	Mar. 19, 1874	25.695	25.665	25.612	25.552	25.579	25.576	25.644	25.641	25.639	25.653	25.753	25.678	25.640
Northern Plateau:														
Boisé City, Idaho	July 1, 1877	27.282	27.243	27.186	27.114	27.130	27.106	27.156	27.134	27.174	27.214	27.243	27.250	27.194
Lewiston, Idaho	July 1, 1879	29.350	29.307	29.201	29.136	29.157	29.096	29.141	29.130	29.160	29.215	29.380	29.282	29.218
Dayton, Wash	July 1, 1879	28.383	28.335	28.253	28.223	28.247	28.204	28.256	28.253	28.257	28.261	28.394	28.336	28.284
Spokane Falls, Wash	Feb. 5, 1881	28.076	28.029	27.974	27.919	27.952	27.908	27.967	27.964	27.955	27.954	28.080	28.032	27.984
North Pacific Coast:														
Canby, Fort, Wash	Sept. 1, 1883	29.890	29.823	29.731	29.744	29.825	29.772	29.856	29.846	29.799	29.827	29.875	29.803	29.818
Olympia, Wash	July 1, 1877	30.040	30.047	29.999	29.941	30.018	29.979	30.028	29.999	29.999	29.995	30.111	29.960	30.010
Tatoosh Island, Wash	Oct. 1, 1883	29.958	29.917	29.819	29.828	29.920	29.878	29.962	29.923	29.874	29.908	29.942	29.816	29.896
Portland, Oreg	Nov. 1, 1871	30.046	30.050	29.983	29.921	29.980	29.950	29.901	29.962	29.960	29.966	30.104	29.963	29.991
Roseburg, Oreg	July 15, 1877	29.592	29.572	29.508	29.459	29.501	29.477	29.509	29.481	29.483	29.521	29.626	29.494	29.519
Middle Pacific Coast:														
Cape Mendocino, Cal	July 27, 1882	29.458	29.346	29.269	29.315	29.315	29.323	29.306	29.303	29.302	29.331	29.368	29.378	29.334
Red Bluff, Cal	July 1, 1877	29.807	29.768	29.677	29.633	29.599	29.539	29.535	29.517	29.558	29.651	29.762	29.729	29.648
Sacramento, Cal	July 1, 1877	30.097	30.060	29.975	29.946	29.893	29.848	29.838	29.816	29.842	29.935	30.054	30.035	29.944
San Francisco, Cal	Mar. 8, 1871	30.097	30.069	29.999	29.984	29.944	29.913	29.916	29.801	29.897	29.966	30.062	30.086	29.961
South Pacific Coast:														
Los Angeles, Cal	July 1, 1877	29.785	29.729	29.686	29.661	29.601	29.571	29.598	29.560	29.558	29.611	29.686	29.695	29.641
San Diego, Cal	Nov. 1, 1871	30.081	30.040	29.993	29.960	29.898	29.867	29.887	29.847	29.843	29.902	29.972	29.984	29.985

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[1] Observations discontinued June 15, 1883, and recommenced December 1, 1884.

Monthly constants for the reduction to sea-level of barometric observations made at Signal Service stations.

[The column headed "Altitude" contains the elevation above sea-level of the barometers at the several stations as adopted by this office. The letter B denotes that the altitude has been obtained from barometric readings. The values given in this column will be used on all forms instead of values heretofore in use.]

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y	83	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
Alexander, Fort, Alaska	88	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Alpena, Mich	609	0.71	0.71	0.70	0.69	0.66	0.65	0.64	0.64	0.65	0.67	0.70	0.71
Apache, Fort, Ariz	5050 B	5.12	5.10	5.02	4.92	4.82	4.75	4.74	4.72	4.80	4.90	5.10	5.08
Assinaboine, Fort, Mont	2720 B	3.06	3.05	3.02	2.91	2.85	2.80	2.74	2.76	2.86	2.93	2.99	3.04
Atlanta, Ga	1129	1.23	1.22	1.21	1.19	1.17	1.15	1.15	1.15	1.17	1.19	1.22	1.23
Atlantic City, N. J	18	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Augusta, Ga	183	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20
Baltimore, Md	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Barnegat City, N. J	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Behring's Island, Behring Sea	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Bennett, Fort, Dak	1510 B	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.51	1.59	1.62	1.69	1.76
Benton, Fort, Mont	2681 B	2.97	2.99	2.97	2.85	2.78	2.76	2.70	2.78	2.83	2.90	2.95	2.99
Bismarck, Dak	1694	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.88	1.98	2.02
Block Island, R. I	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Boisé City, Idaho	2750 B	2.93	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.98
Boston, Mass	122	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.14	0.14	0.14
Brownsville, Tex	57	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Buffalo, N. Y	690	0.79	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.77	0.79
Buford, Fort, Dak	1930 B	2.23	2.21	2.16	2.10	2.00	1.99	1.96	1.98	2.02	2.10	2.16	2.27
Cairo, Ill	377	0.42	0.42	0.42	0.41	0.40	0.39	0.39	0.39	0.40	0.40	0.42	0.42
Canby, Fort, Wash	179	0.20	0.20	0.20	0.20	0.20	0.19	0.19	0.19	0.20	0.20	0.20	0.20
Cape Henry, Va	16	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cape May, N. J	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cape Mendocino, Cal	637	0.70	0.70	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.69	0.70	0.70
Cedar Keys, Fla	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charleston, S. C	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Charlotte, N. C	808	0.89	0.89	0.88	0.86	0.84	0.83	0.83	0.83	0.84	0.86	0.88	0.89
Chattanooga, Tenn	783	0.86	0.86	0.85	0.83	0.81	0.81	0.80	0.80	0.81	0.83	0.85	0.86
Cheyenne, Wyo	6105	6.27	6.27	6.20	6.02	5.89	5.76	5.71	5.73	5.88	6.04	6.23	6.30
Chicago, Ill	661	0.75	0.75	0.74	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Chincoteague, Va	8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cincinnati, Ohio	620	0.69	0.69	0.69	0.67	0.65	0.65	0.64	0.64	0.65	0.66	0.69	0.70
Cleveland, Ohio	690	0.78	0.79	0.78	0.76	0.73	0.73	0.72	0.72	0.72	0.74	0.77	0.79
Coleman City, Tex	1709	1.88	1.86	1.83	1.82	1.79	1.75	1.76	1.74	1.70	1.82	1.89	1.90
Columbus, Ohio	805	0.90	0.90	0.89	0.87	0.84	0.84	0.83	0.83	0.84	0.86	0.89	0.91
Concho, Fort, Tex	1900 B	2.02	2.02	1.97	1.94	1.90	1.87	1.88	1.86	1.90	1.95	2.01	2.03
Custer, Fort, Mont	3040 B	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa	615	0.71	0.70	0.69	0.67	0.64	0.64	0.63	0.63	0.65	0.66	0.69	0.71
Davis, Fort, Tex	4928 B	4.97	4.95	4.87	4.78	4.71	4.60	4.63	4.64	4.69	4.84	4.89	4.98
Dayton, Wash	1667 B	1.81	1.82	1.82	1.76	1.76	1.75	1.72	1.72	1.75	1.79	1.79	1.84
Deadwood, Dak	4600 B	4.95	4.92	4.84	4.69	4.52	4.44	4.43	4.44	4.56	4.68	4.84	4.99
Delaware Breakwater, Del	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Denver, Colo	5294	5.52	5.52	5.44	5.27	5.16	5.04	5.01	5.02	5.11	5.26	5.50	5.52
Des Moines, Iowa	849	0.97	0.97	0.96	0.93	0.89	0.88	0.88	0.88	0.89	0.92	0.95	0.98
Detroit, Mich	661	0.76	0.75	0.75	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Dodge City, Kans	2517	2.75	2.74	2.73	2.64	2.55	2.51	2.50	2.48	2.55	2.63	2.74	2.80
Dubuque, Iowa	665	0.77	0.76	0.75	0.73	0.70	0.69	0.69	0.69	0.70	0.72	0.75	0.77
Duluth, Minn	672	0.79	0.79	0.77	0.75	0.73	0.71	0.70	0.70	0.72	0.74	0.77	0.80
Eastport, Me	61	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07
Elliott, Fort, Tex	2650 B	2.93	2.90	2.83	2.78	2.70	2.67	2.64	2.64	2.69	2.79	2.93	2.96
El Paso, Tex	3764 B	3.88	3.88	3.80	3.74	3.64	3.59	3.60	3.60	3.65	3.74	3.85	3.86
Erie, Pa	681	0.77	0.77	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.77
Escanaba, Mich	613	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.67	0.70	0.72
Fort Smith, Ark	451	0.50	0.50	0.49	0.48	0.47	0.46	0.46	0.46	0.47	0.48	0.49	0.50
Galveston, Tex	40	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Grand Haven, Mich	620	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71
Grant, Fort, Ariz	4856 B	4.90	4.86	4.83	4.73	4.61	4.54	4.57	4.57	4.60	4.70	4.84	4.88
Hatteras, N. C	12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Helena, Mont	4044 B	4.38	4.35	4.32	4.21	4.12	4.07	4.01	4.04	4.12	4.25	4.33	4.38
Huron, Dak	1305	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind	753	0.84	0.85	0.84	0.82	0.79	0.78	0.77	0.77	0.78	0.80	0.84	0.85
Indianola, Tex	26	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Jacksonville, Fla	43	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Keokuk, Iowa	618	0.70	0.70	0.69	0.67	0.65	0.64	0.63	0.63	0.65	0.67	0.69	0.71
Key West, Fla	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Kitty Hawk, N. C	9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Knoxville, Tenn	980	1.08	1.08	1.06	1.04	1.02	1.01	1.00	1.01	1.02	1.04	1.07	1.06
La Crosse, Wis	725	0.84	0.84	0.82	0.80	0.76	0.76	0.75	0.75	0.77	0.79	0.82	0.85
Leavenworth, Kans	842	0.96	0.95	0.94	0.91	0.88	0.87	0.86	0.86	0.88	0.90	0.94	0.98
Lewiston, Idaho	780 B	0.87	0.87	0.86	0.85	0.84	0.82	0.81	0.81	0.83	0.85	0.87	0.88

Monthly constants for the reduction to sea-level of barometric observations, &c.—Continued.

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Little Rock, Ark	299	0.33	0.33	0.33	0.32	0.31	0.31	0.31	0.31	0.31	0.32	0.33	0.33
Los Angeles, Cal	371	0.40	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.40	0.40	0.40
Louisville, Ky	530	0.59	0.59	0.59	0.57	0.55	0.55	0.55	0.55	0.55	0.57	0.59	0.60
Lynchburg, Va	652	0.72	0.72	0.72	0.71	0.68	0.67	0.67	0.67	0.68	0.69	0.72	0.73
Mackinaw City, Mich	605	0.70	0.70	0.70	0.68	0.65	0.64	0.64	0.64	0.65	0.67	0.69	0.70
Macon, Fort, N. C	11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maginnis, Fort, Mont	4340 B	4.77	4.75	4.60	4.50	4.41	4.33	4.31	4.31	4.40	4.54	4.60	4.63
Marquette, Mich	673	0.78	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.72	0.74	0.77	0.78
Memphis, Tenn	321	0.36	0.35	0.35	0.34	0.33	0.33	0.33	0.33	0.34	0.34	0.35	0.36
Milwaukee, Wis	697	0.80	0.80	0.79	0.77	0.74	0.74	0.73	0.73	0.74	0.76	0.79	0.81
Mobile, Ala	35	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Montgomery, Ala	219	0.24	0.24	0.24	0.23	0.23	0.23	0.22	0.23	0.23	0.23	0.24	0.24
Moorhead, Minn	923	1.11	1.10	1.08	1.03	0.98	0.97	0.96	0.97	0.99	1.02	1.06	1.11
Mount Washington, N. H	6279	6.63	6.62	6.52	6.41	6.18	6.12	6.07	6.08	6.15	6.34	6.56	6.63
Myer, Fort, Va	267	0.30	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.29	0.30	0.30
Nashville, Tenn	549	0.61	0.61	0.60	0.58	0.57	0.56	0.56	0.56	0.57	0.58	0.60	0.61
New Haven, Conn	107	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.12	0.12	0.12
New London, Conn	47	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
New Orleans, La	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
New York City	164	0.19	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.18	0.18	0.19
Norfolk, Va	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
North Platte, Nebr	2841	3.12	3.10	3.06	2.96	2.87	2.80	2.80	2.80	2.88	2.96	3.08	3.16
Olympia, Wash	36	0.04	0.04	0.04	0.01	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Omaha, Nebr	1113	1.27	1.27	1.25	1.21	1.16	1.14	1.13	1.14	1.17	1.20	1.24	1.29
Oswego, N. Y	334	0.38	0.38	0.37	0.37	0.36	0.35	0.35	0.35	0.35	0.36	0.37	0.38
Palestine, Tex	533	0.58	0.58	0.57	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.57	0.58
Pensacola, Fla	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Philadelphia, Pa	117	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13
Pike's Peak, Colo	14134	12.70	12.72	12.59	12.28	12.06	11.82	11.78	11.79	11.98	12.28	12.66	12.66
Pittsburg, Pa	766	0.85	0.86	0.85	0.83	0.80	0.79	0.79	0.79	0.79	0.82	0.85	0 86
Poplar River, Mont	2030 B	2.35	2.35	2.30	2.20	2.12	2.10	2.06	2.08	2.15	2.22	2.29	2.36
Port Huron, Mich	633	0.73	0.73	0.72	0.70	0.68	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Portland, Me	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Portland, Oreg	67	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Prescott, Ariz	5389	5.43	5.41	5.39	5.27	5.14	5.06	5.03	5.02	5.14	5.20	5.39	5.42
Provincetown, Mass	26	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0 03
Red Bluff, Cal	332	0.37	0.37	0.37	0.36	0.35	0.35	0.34	0.35	0.35	0.36	0.37	0.37
Rio Grande City, Tex	230 B	0.25	0.25	0.24	0.24	0.24	0.23	0.23	0.24	0.24	0.24	0.25	0.25
Rochester, N. Y	621	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.65	0.67	0.70	0.71
Roseburg, Oreg	523	0.58	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.56	0.57	0.58	0.58
Sacramento, Cal	64	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Saint Louis, Mo	571	0.65	0.65	0.64	0.62	0.60	0.59	0.59	0.59	0.60	0.61	0.64	0.65
Saint Michael's, Fort, Alaska	30	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
Saint Paul, Minn	801	0.94	0.93	0.91	0.88	0.84	0.84	0.83	0.83	0.85	0.87	0.91	0.95
Saint Vincent, Minn	804	0.98	0.97	0.94	0.91	0.86	0.85	0.84	0.85	0.87	0.90	0.93	0.99
Salt Lake City, Utah	4348	4.57	4.56	4.52	4.37	4.32	4.22	4.18	4.10	4.25	4.40	4.57	4.54
San Diego, Cal	67	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Sandusky, Ohio	639	0.72	0.72	0.72	0.70	0.67	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Sandy Hook, N. J	28	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Sanford, Fla	36 B	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
San Francisco, Cal	60	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Savannah, Ga	87	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
Shaw, Fort, Mont	3550 B	3.86	3.85	3.80	3.67	3.60	3.57	3.51	3.53	3.61	3.70	3.82	3.83
Shreveport, La	227	0.25	0.25	0.25	0.24	0.24	0.23	0.23	0.23	0.24	0.24	0.25	0.26
Sill, Fort, Ind. T	1200 B	1.33	1.31	1.29	1.24	1.22	1.20	1.20	1.18	1.22	1.26	1.31	1.33
Sitka, Alaska	63	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07
Smithville, N. C	34	0.04	0.04	0.04	0.04	0.04	0.04	0 03	0.04	0.04	0.04	0.04	0.04
Spokane Falls, Wash	1906	2.14	2.13	2.13	2.06	2.05	2.04	1.98	2.00	2.04	2.08	2.08	2.13
Springfield, Ill	644	0.73	0.73	0.72	0.70	0.67	0.67	0.66	0.66	0.67	0.69	0.72	0.73
Stockton, Fort, Tex	3010 B	3.14	3.13	3.08	3.03	3.01	2.92	2.94	2.94	2.96	3.03	3.12	3.14
Tatoosh Island, Wash	86	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0 09	0.10	0.10
Thomas, Camp, Ariz	2710 B	2.83	2.83	2.78	2.73	2.67	2.63	2.59	2.62	2.64	2.71	2.84	2.82
Toledo, Ohio	651	0.74	0.74	0.73	0.71	0.68	0.68	0.67	0.67	0.68	0.70	0.73	0.74
Unalashka, Alaska	13	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Vicksburg, Miss	244	0.27	0.27	0.26	0.26	0.25	0.25	0.24	0.24	0.25	0.26	0.27	0.27
Washington City	106	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12
West Las Animas, Colo	3899	4.13	4.12	4.07	3.95	3.85	3.77	3.75	3.74	3.82	3.93	4.11	4.15
Wilmington, N. C	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Winnemucca, Nev	4358	4.55	4.54	4.51	4.41	4.34	4.26	4.19	4.22	4.30	4.43	4.53	4.57
Yankton, Dak	1228	1.42	1.42	1.39	1.34	1.28	1.28	1.27	1.27	1.29	1.33	1.38	1.43
Yuma, Ariz	141	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.15

APPENDIX 6.

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, United States Army, for each month of the year. (Compiled from the commencement of observations at each station, to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
New England:												
Eastport, Me	30.61	30.66	30.52	30.38	30.41	30.31	30.22	30.29	30.44	30.48	30.58	30.62
Portland, Me	30.66	30.67	30.54	30.39	30.41	30.32	30.23	30.30	30.44	30.50	30.58	30.64
Mount Washington, N. H	30.40	30.36	30.32	30.32	30.41	30.48	30.38	30.44	30.47	30.45	30.44	30.41
Boston, Mass	30.67	30.68	30.55	30.40	30.42	30.33	30.24	30.32	30.43	30.53	30.60	30.65
Block Island, R. I	30.70	30.79	30.50	30.41	30.44	30.40	30.24	30.34	30.40	30.52	30.57	30.58
New Haven, Conn	30.68	30.68	30.55	30.41	30.41	30.32	30.25	30.31	30.41	30.53	30.60	30.65
New London, Conn	30.68	30.69	30.56	30.42	30.44	30.34	30.26	30.33	30.43	30.54	30.61	30.65
Middle Atlantic States:												
Albany, N. Y	30.71	30.73	30.53	30.42	30.39	30.29	30.23	30.30	30.42	30.52	30.60	30.68
New York City	30.69	30.70	30.55	30.42	30.41	30.32	30.25	30.31	30.40	30.54	30.62	30.65
Philadelphia, Pa	30.70	30.70	30.55	30.42	30.41	30.32	30.25	30.30	30.40	30.54	30.62	30.65
Atlantic City, N. J	30.68	30.69	30.53	30 42	30.39	30.30	30.23	30.28	30.37	30.52	30.59	30.61
Barnegat City, N. J	30.68	30.68	30.53	30.42	30.39	30.30	30.22	30.27	30.37	30.51	39.59	30.60
Cape May, N. J	30.67	30.66	30.54	30.39	30.38	30.29	30.24	30.27	30.37	30.51	30.58	30.62
Sandy Hook, N. J	30.69	30.70	30.53	30.42	30.41	30.31	30.23	30.29	30.40	30.52	30.60	30.63
Delaware Breakwater, Del	30.77	30.74	30.54	30.39	30.39	30.32	30.23	30.33	30.37	30.52	30.62	30.60
Baltimore, Md	30.70	30.71	30.56	30.42	30.41	30.32	30.25	30.29	30.39	30.54	30.63	30.65
Washington City	30.69	30.70	30.56	30.41	30.41	30.31	30.24	30.29	30.38	30.55	30.62	30.66
Cape Henry, Va	30.66	30.65	30.52	30.40	30.36	30.28	30.24	30.26	30.34	30.49	30.56	30.59
Chincoteague, Va	30.76	30.74	30.50	30.39	30.38	30.32	30.22	30.32	30.35	30.51	30.61	30.58
Lynchburg, Va	30.66	30.66	30.54	30.39	30.37	30.29	30.24	30.26	30.37	30.53	30.60	30.63
Norfolk, Va	30.66	30.65	30.55	30.40	30.37	30.30	30.26	30.26	30.35	30.50	30.57	30.61
South Atlantic States:												
Charlotte, N. C	30.61	30.61	30.48	30.34	30.32	30.25	30.22	30.26	30.33	30.51	30.56	30.56
Hatteras, N. C	30.69	30.64	30.46	30.37	30.34	30.26	30.23	30.24	30.30	30.46	30.52	30.52
Kitty Hawk, N. C	30.65	30.68	30.54	30.40	30.36	30.29	30.26	30.26	30.34	30.48	30.53	30.57
Macon, Fort, N. C	30.68	30.62	30.45	30.36	30.31	30.24	30.24	30.24	30.30	30.42	30.53	30.55
Smithville, N. C	30.60	30.58	30.51	30.39	30.33	30.27	30.25	30.26	30.30	30.45	30.50	30.54
Wilmington, N. C	36.61	30.58	30.52	30.38	30.32	30.27	30.25	30.25	30.30	30.46	30.51	30.56
Charleston, S. C	30.60	30.52	30.50	30.37	30.30	30.24	30.25	30.23	30.26	30.42	30.48	30.58
Augusta, Ga	30.62	30.57	30.52	30.37	30.31	30.27	30.26	30.26	30.31	30.46	30.54	30.58
Savannah, Ga	30.58	30.51	30.50	30.36	30.29	30.24	30.25	30.23	30.26	30.40	30.48	30.58
Jacksonville, Fla	30.52	30.45	30.44	30.33	30.28	30.21	30.23	30.21	30.20	30.33	30.40	30.46
Florida Peninsula:												
Cedar Keys, Fla	30.51	30.44	30.37	30.31	30.24	30.19	30.21	30.20	30.21	30.30	30.38	30.41
Key West, Fla	30.35	33.30	30.31	30.22	30.14	30.16	30.17	30.13	30.12	30.17	30.23	30.30
Sanford, Fla	30.52	30.31	30.34	30.18	30.20	30.12	30.18	30.17	30.18	30.24	30.26	30.29
Eastern Gulf States:												
Atlanta, Ga	30.57	30.51	30.46	30.36	30.29	30.23	30.23	30.24	30.30	30 44	30.52	30.54
Pensacola, Fla	30.58	30.49	30.41	30.33	30.26	30.20	30.20	30.19	30.21	30.34	30.50	30.50
Mobile, Ala	30.58	30.48	30.44	30.32	30.25	30.20	30.22	30.19	30.20	30.36	30.46	30.51
Montgomery, Ala	30.61	30.52	30.47	30.33	30.26	30.22	30.22	30.21	30.24	30.39	30.49	30.53
Vicksburg, Miss	30.68	30.56	30.47	30.34	30.26	30.20	30.22	30.20	30.26	30.43	30.56	30.60
New Orleans, La	30.57	30.48	30.42	30.29	30.22	30.17	30.19	30.16	30.18	30.35	30.47	30.51
Western Gulf States:												
Shreveport, La	30.65	30.54	30.46	30.32	30.23	30.18	30.19	30.17	30.24	30 40	30.54	30.60
Fort Smith, Ark	30.75	30.63	30.54	30.30	30.22	30.18	30.21	30.21	30.25	30.41	30.60	30.71
Little Rock, Ark	30.68	30.61	30.49	30.34	30.27	30.19	30.20	30.19	30.27	30.42	30.65	30.69
Galveston, Tex	30.59	30.50	30.40	30.30	30.20	30.15	30.17	30.15	30.19	30.36	30.50	30.52
Indianola, Tex	30.59	30.52	30.42	30.33	30.20	[illegible]	30.17	30.15	30.20	30.38	30.55	30.57
Palestine, Tex	30.72	30.55	30.51	30.33	30.24	30.18	30.21	30.18	30.26	30.34	30.62	30.65
Rio Grande Valley:												
Brownsville, Tex	30.50	30.42	30.32	30.27	30.15	30.08	30.09	30.06	30.11	30.25	30.46	30.54
Rio Grande City, Tex	30.60	30.49	30.40	30.30	30.13	30.10	30.09	30.09	30.17	30.35	30.56	30.59
Ohio Valley and Tennessee:												
Chattanooga, Tenn	30.62	30.57	30.48	30.38	30.30	30.26	30.24	30.24	30.30	30.46	30.60	30.58
Knoxville, Tenn	30.65	30.58	30.50	30.35	30.30	30.24	30.24	30.25	30.30	30.47	30.55	30.58
Memphis, Tenn	30.72	30.59	30.50	30.32	30.25	30.19	30.20	30.19	30.28	30.44	30.57	30.62
Nashville, Tenn	30.68	30.58	30.50	30.32	30.28	30.21	30.20	30.21	30.27	30.44	30.57	30.60
Louisville, Ky	30.66	30.61	30.48	30.29	30.28	30.20	30.20	30.20	30.30	30.44	30.55	30.59
Indianapolis, Ind	30.64	30.62	30.48	30.30	30.31	30.20	30.20	30.21	30.32	30.45	30.56	30.59

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ohio Valley and Tennessee—Continued.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Cincinnati, Ohio	30.68	30.64	30.50	30.34	30.33	30.22	30.21	30.22	30.33	30.47	30.58	30.61
Columbus, Ohio	30.66	30.62	30.48	30.36	30.34	30.26	30.19	30.22	30.37	30.50	30.61	30.62
Pittsburg, Pa	30.64	30.64	30.51	30.36	30.34	30.26	30.21	30.24	30.36	30.48	30.57	30.58
Lower Lakes:												
Buffalo, N. Y	30.64	30.67	30.51	30.39	30.35	30.26	30.20	30.26	30.38	30.48	30.56	30.61
Oswego, N. Y	30.68	30.70	30.54	30.39	30.38	30.29	30.22	30.29	30.41	30.51	30.59	30.65
Rochester, N. Y	30.67	30.69	30.53	30.40	30.36	30.26	30.21	30.26	30.39	30.50	30.59	30.62
Erie, Pa	30.63	30.65	30.49	30.40	30.35	30.26	30.19	30.25	30.36	30.45	30.55	30.57
Cleveland, Ohio	30.62	30.65	30.51	30.39	30.36	30.27	30.21	30.25	30.36	30.46	30.56	30.59
Sandusky, Ohio	30.64	30.63	30.50	30.36	30.38	30.27	30.20	30.23	30.38	30.48	30.59	30.60
Toledo, Ohio	30.61	30.62	30.50	30.37	30.36	30.24	30.20	30.23	30.35	30.46	30.56	30.59
Detroit, Mich	30.63	30.64	30.51	30.39	30.38	30.26	30.21	30.25	30.36	30.46	30.57	30.58
Upper Lakes:												
Alpena, Mich	30.62	30.66	30.54	30.45	30.40	30.26	30.22	30.27	30.40	30.47	30.57	30.55
Escanaba, Mich	30.63	30.65	30.56	30.43	30.41	30.27	30.23	30.25	30.41	30.46	30.59	30.57
Grand Haven, Mich	30.59	30.62	30.51	30.37	30.37	30.25	30.21	30.25	30.37	30.46	30.54	30.57
Mackinaw City, Mich	30.68	30.66	30.52	30.46	30.30	30.42	30.18	30.36	30.53	30.56	30.54	30.52
Marquette, Mich	30.61	30.68	30.55	30.44	30.38	30.27	30.24	30.26	30.41	30.47	30.57	30.53
Port Huron, Mich	30.62	30.66	30.48	30.39	30.39	30.24	30.21	30.24	30.37	30.46	30.55	30.56
Chicago, Ill	30.62	30.63	30.52	30.34	30.36	30.23	30.21	30.23	30.33	30.47	30.56	30.59
Milwaukee, Wis	30.64	30.65	30.54	30.38	30.39	30.26	30.24	30.26	30.38	30.49	30.59	30.61
Duluth, Minn	30.69	30.75	30.61	30.44	30.36	30.24	30.22	30.24	30.38	30.50	30.67	30.63
Upper Mississippi Valley:												
Saint Paul, Minn	30.67	30.70	30.56	30.36	30.31	30.16	30.18	30.21	30.35	30.46	30.63	30.62
La Crosse, Wis	30.68	30.71	30.56	30.36	30.36	30.20	30.23	30.24	30.37	30.50	30.63	30.64
Davenport, Iowa	30.70	30.69	30.53	30.33	30.35	30.21	30.23	30.25	30.37	30.49	30.62	30.64
Des Moines, Iowa	30.72	30.65	30.58	30.39	30.34	30.20	30.23	30.23	30.38	30.52	30.64	30.70
Dubuque, Iowa	30.68	30.68	30.52	30.36	30.34	30.19	30.23	30.25	30.37	30.50	30.62	30.64
Keokuk, Iowa	30.69	30.64	30.51	30.29	30.30	30.16	30.18	30.20	30.32	30.46	30.59	30.64
Cairo, Ill	30.76	30.64	30.53	30.33	30.29	30.22	30.22	30.23	30.31	30.47	30.60	30.65
Springfield, Ill	30.71	30.66	30.51	30.33	30.34	30.22	30.24	30.26	30.35	30.49	30.65	30.68
Saint Louis, Mo	30.74	30.65	30.53	30.32	30.30	30.20	30.22	30.23	30.33	30.49	30.61	30.66
Missouri Valley:												
Leavenworth, Kans	30.76	30.64	30.55	30.36	30.25	30.17	30.19	30.20	30.34	30.48	30.64	30.68
Omaha, Nebr	30.73	30.67	30.56	30.40	30.26	30.16	30.20	30.22	30.36	30.49	30.66	30.70
Bennett, Fort, Dak	30.79	30.73	30.66	30.55	30.29	30.12	30.17	30.22	30.33	30.46	30.62	30.84
Huron, Dak	30.82	30.73	30.67	30.54	30.22	30.15	30.18	30.23	30.34	30.50	30.66	30.79
Yankton, Dak	30.82	30.74	30.67	30.49	30.31	30.20	30.23	30.27	30.42	30.56	30.75	30.77
Extreme Northwest:												
Moorhead, Minn	30.79	30.76	30.62	30.53	30.32	30.13	30.20	30.27	30.33	30.51	30.66	30.75
Saint Vincent, Minn	30.78	30.84	30.64	30.56	30.33	30.16	30.19	30.28	30.36	30.49	30.66	30.78
Bismarck, Dak	30.67	30.65	30.57	30.45	30.27	30.20	30.17	30.26	30.34	30.52	30.69	30.67
Buford, Fort, Dak	30.80	30.79	30.68	30.55	30.22	30.10	30.17	30.21	30.35	30.46	30.70	30.89
Northern Slope:												
Assinaboine, Fort, Mont	30.69	30.75	30.59	30.56	30.30	30.17	30.16	30.18	30.44	30.47	30.64	30.78
Benton, Fort, Mont	30.61	30.58	30.51	30.48	30.33	30.26	30.24	30.28	30.51	30.49	30.67	30.65
Custer, Fort, Mont	30.72	30.67	30.53	30.52	30.24	30.08	30.11	30.20	30.39	30.47	30.67	30.83
Helena, Mont	30.60	30.58	30.49	30.40	30.28	30.13	30.17	30.19	30.42	30.47	30.66	30.74
Maginnis, Fort, Mont	30.63	30.66	30.54	30.39	30.26	30.12	30.09	30.16	30.40	30.32	30.47	30.63
Shaw, Fort, Mont	30.63	30.64	30.53	30.48	30.30	30.20	30.15	30.18	30.39	30.38	30.61	30.70
Deadwood, Dak	30.56	30.55	30.54	30.46	30.14	30.04	30.08	30.15	30.33	30.42	30.62	30.73
Cheyenne, Wyo	30.26	30.27	30.26	30.22	30.19	30.18	30.19	30.22	30.32	30.33	30.34	30.36
North Platte, Nebr	30.49	30.42	30.35	30.23	30.03	30.02	29.96	30.04	30.18	30.33	30.53	30.54
Middle Slope:												
Denver, Colo	30.36	30.33	30.33	30.30	30.25	30.20	30.21	30.25	30.35	30.36	30.44	30.48
Pike's Peak, Colo	30.17	30.19	30.22	30.14	30.15	30.25	30.31	30.30	30.29	30.31	30.35	30.27
W. Las Animas, Colo	30.54	30.52	30.51	30.38	30.17	30.04	30.04	30.06	30.23	30.37	30.59	30.67
Dodge City, Kans	30.55	30.40	30.36	30.22	30.04	30.02	29.98	30.03	30.16	30.33	30.51	30.52
Elliott, Fort, Tex	30.42	30.32	30.26	30.19	29.94	30.01	30.03	30.12	30.24	30.40	30.62	30.54
Southern Slope:												
Sill, Fort, Ind. T	30.58	30.47	30.43	30.28	30.18	30.08	30.08	30.05	30.22	30.37	30.53	30.64
Concho, Fort, Tex	30.50	30.43	30.33	30.21	30.00	30.01	30.00	30.00	30.13	30.39	30.50	30.61
Davis, Fort, Tex	30.49	30.41	30.36	30.18	30.10	30.00	30.05	30.20	30.24	30.37	30.46	30.46
Stockton, Fort, Tex	30.47	30.39	30.34	30.26	30.14	30.08	30.08	30.13	30.22	30.33	30.48	30.53
Southern Plateau:												
Santa Fé, N. Mex	30.14	30.11	30.09	30.03	29.98	30.00	30.05	30.06	30.10	30.15	30.20	30.13
El Paso, Tex	30.56	30.46	30.31	30.27	30.11	29.97	30.03	30.05	30.17	30.32	30.53	30.54
Apache, Fort, Ariz	30.48	30.53	30.43	30.33	30.21	30.02	30.07	30.07	30.16	30.27	30.49	30.50
Grant, Fort, Ariz	30.32	30.26	30.20	30.12	30.04	30.01	30.04	30.05	30.08	30.18	30.30	30.34
Prescott, Ariz	30.39	30.38	30.33	30.23	30.16	30.09	30.12	30.11	30.19	30.27	30.40	30.43
Thomas, Camp, Ariz	30.44	30.41	30.23	30.16	30.02	29.94	29.92	29.96	30.02	30.19	30.40	30.40
Yuma, Ariz	30.43	30.38	30.21	30.15	30.04	29.94	29.93	29.95	29.99	30.14	30.31	30.40
Middle Plateau:												
Winnemucca, Nev	30.47	30.47	30.40	30.24	30.25	30.12	30.11	30.28	30.23	30.38	30.52	30.56
Salt Lake City, Utah	30.49	30.47	30.37	30.24	30.19	30.13	30.09	30.11	30.22	30.33	30.58	30.53

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Northern Plateau:	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In*	*In.*
Boisé City, Idaho	30.66	30.61	30.54	30.35	30.37	30.24	30.14	30.19	30.34	30.45	30.68	30.70
Lewiston, Idaho	30.80	30.66	30.45	30.29	30.31	30,18	30.23	30.22	30.33	30.43	30.64	30.66
Dayton, Wash	30.75	30.61	30.48	30.29	30.32	30.20	30.23	30.24	30.31	30.40	30.56	30.66
Spokane Falls, Wash	30.71	30.61	30.47	30.30	30.33	30.17	30.18	30.23	30.32	30.41	30.54	30.67
North Pacific Coast:												
Olympia, Wash	30.57	30.54	30.47	30.35	30.37	30.27	30.27	30.22	30.34	30.46	30.51	30.50
Tatoosh Island, Wash	30.54	30.55	30.33	30.29	30.32	30.19	30.21	30.26	30.25	30.40	30.48	30.46
Portland, Oreg	30.59	30.56	30.47	30.45	30.40	30.34	30.29	30.27	30.32	30.46	30.49	30.53
Roseburg, Oreg	30.59	30.53	30.48	30.40	30.37	30.30	30.24	30.21	30.31	30.48	30.54	30.54
Middle Pacific Coast:												
Cape Mendocino, Cal	30.44	30.50	30.25	30.28	30.26	30.26	30.18	30.15	30.16	30.29	30.31	30.35
Red Bluff, Cal	30.61	30.47	30.37	30.29	30.19	30.14	30.05	30.07	30.11	30.28	30.43	30.46
Sacramento, Cal	30.49	30.46	30.34	30.28	30.19	30.13	30.06	30.08	30.11	30.25	30.41	30.45
San Francisco, Cal	30.44	30.44	30.34	30.32	30.20	30.17	30.11	30.13	30.13	30.25	30.37	30.39
South Pacific Coast:												
Los Angeles, Cal	30.37	30.35	30.26	30.21	30.14	30.08	30.05	30.05	30.06	30.15	30.26	30.34
San Diego, Cal	30.33	30.33	30.27	30.23	30.12	30.08	30.07	30.05	30.06	30.14	30.24	30.30
Alaska Stations:												
Saint Michael's, Fort, Alaska	30.56	30.71	30.38	30.42	30.36	30.26	30.22	30.20	30.16	30.40	30.42	30.59
Sitka, Alaska	30.49	30.74	30.34	30.48	30.44	30.27	30.36	30.23	30.34	30.37	30.38	30.44
Unalashka, Alaska	30.50	30.71	30.48	30.38	30.41	30.39	30.40	30.34	30.35	30.47	30.48	30.50
Behring's Island, Behring Sea	30.13	30.54	30.21	30.36	30.38	30.28	30.09	30.20	30.40	30.29	30.39	30.21

APPENDIX 7.

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, United States Army, for each month of the year. (Compiled from the commencement of observations at each station, to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
New England:												
Eastport, Me	29.12	29.05	29.09	29.12	29.42	29.42	29.49	29.52	29.46	29.29	29.09	29.09
Portland, Me	29.26	29.19	29.13	29.24	29.48	29.48	29.56	29.61	29.52	29.34	29.25	29.18
Mt. Washington, N. H	29.17	29.14	29.13	29.24	29.49	29.67	29.75	29.82	29.65	29.46	29.24	29.15
Boston, Mass	29.31	29.24	29.17	29.29	29.51	29.52	29.62	29.63	29.57	29.43	29.26	29.29
Block Island, R. I	29.34	29.30	29.21	29.30	29.53	29.61	29.62	29.68	29.64	29.53	29.54	29.42
New Haven, Conn	29.39	29.30	29.24	29.39	29.54	29.56	29.65	29.67	29.62	29.47	29.35	29.37
New London, Conn	29.38	29.28	29.23	29.35	29.55	29.57	29.66	29.67	29.62	29.47	29.33	29.35
Middle Atlantic States:												
Albany, N. Y	29.38	29.34	29.28	29.39	29.54	29.55	29.59	29.63	29.60	29.46	29.39	29.43
New York City	29.40	29.33	29.30	29.43	29.57	29.59	29.65	29.70	29.65	29.50	29.39	29.40
Philadelphia, Pa	29.43	29.37	29.30	29.45	29.57	29.62	29.67	29.69	29.65	29.51	29.42	29.42
Atlantic City, N. J	29.40	29.36	29.30	29.42	29.58	29.62	29.66	29.68	29.64	29.51	29.51	29.39
Barnegat City, N. J	29.38	29.34	29.28	29.41	29.57	29.60	29.63	29.66	29.63	29.49	29.45	29.39
Cape May, N. J	29.45	29.38	29.31	29.46	29.58	29.63	29.70	29.68	29.64	29.51	29.42	29.39
Sandy Hook, N. J	29.38	29.32	29.32	29.41	29.57	29.59	29.64	29.67	29.64	29.51	29.45	29.39
Del. Breakwater, Del	29.30	29.37	29.35	29.47	29.59	29.64	29.68	29.70	29.67	29.59	29.63	29.54
Baltimore, Md	29.47	29.43	29.34	29.48	29.59	29.64	29.70	29.71	29.64	29.51	29.47	29.43
Washington City	29.48	29.45	29.37	29.49	29.58	29.64	29.70	29.71	29.63	29.50	29.47	29.53
Cape Henry, Va	29.46	29.45	29.38	29.45	29.61	29.65	29.70	29.66	29.63	29.57	29.54	29.43
Chincoteague, Va	29.35	29.44	29.37	29.47	29.60	29.66	29.67	29.72	29.67	29.63	29.68	29.57
Lynchburg, Va	29.52	29.50	29.39	29.49	29.61	29.64	29.71	29.71	29.68	29.59	29.52	29.48
Norfolk, Va	29.49	29.46	29.40	29.49	29.62	29.67	29.72	29.71	29.65	29.58	29.50	29.43
South Atlantic States:												
Charlotte, N. C	29.54	29.63	29.51	29.52	29.66	29.66	29.72	29.75	29.76	29.76	29.70	29.62
Hatteras, N. C	29.40	29.54	29.48	29.38	29.58	29.71	29.72	29.78	29.74	29.70	29.64	29.64
Kitty Hawk, N. C	29.46	29.48	29.40	29.46	29.65	29.69	29.74	29.71	29.70	29.61	29.59	29.47
Macon, Fort, N. C	29.48	29.56	29.52	29.42	29.60	29.73	29.72	29.78	29.74	29.73	29.68	29.73
Smithville, N. C	29.58	29.62	29.47	29.53	29.71	29.75	29.77	29.78	29.57	29.63	29.71	29.57
Wilmington, N. C	29.59	29.58	29.48	29.54	29.67	29.72	29.78	29.78	29.56	29.62	29.62	29.52
Charleston, S. C	29.67	29.68	29.57	29.58	29.71	29.77	29.81	29.78	29.66	29.68	29.70	29.63
Augusta, Ga	29.65	29.66	29.60	29.60	29.71	29.75	29.79	29.80	29.71	29.72	29.72	29.67
Savannah, Ga	29.68	29.70	29.62	29.62	29.72	29.78	29.82	29.77	29.68	29.70	29.72	29.66
Jacksonville, Fla	29.72	29.75	29.68	29.67	29.74	29.81	29.84	29.82	29.66	29.72	29.75	29.72
Florida Peninsula:												
Cedar Keys, Fla	29.73	29.83	29.82	29.77	29.79	29.83	29.91	29.75	29.79	29.83	29.83	29.86
Key West, Fla	29.90	29.91	29.88	29.81	29.83	29.91	29.93	29.86	29.77	29.65	29.82	29.86
Sanford, Fla	29.76	29.73	29.84	29.62	29.79	29.79	29.88	29.82	29.82	29.84	29.84	29.92
Eastern Gulf States:												
Atlanta, Ga	29.64	29.66	29.62	29.66	29.71	29.73	29.80	29.79	29.72	29.81	29.70	29.70
Pensacola, Fla	29.80	29.74	29.78	29.74	29.77	29.81	29.87	29.72	29.71	29.83	29.84	29.80
Mobile, Ala	29.79	29.69	29.70	29.67	29.76	29.82	29.87	29.79	29.71	29.78	29.76	29.70
Montgomery, Ala	29.74	29.66	29.66	29.64	29.74	29.79	29.84	29.80	29.73	29.79	29.75	29.70
Vicksburg, Miss	29.77	29.65	29.66	29.59	29.73	29.80	29.89	29.80	29.77	29.84	29.76	29.74
New Orleans, La	29.80	29.69	29.70	29.64	29.75	29.81	29.87	29.80	29.69	29.81	29.77	29.72
Western Gulf States:												
Shreveport, La	29.73	29.58	29.61	29.54	29.67	29.76	29.84	29.75	29.78	29.75	29.67	29.70
Fort Smith, Ark	29.75	29.59	29.60	29.43	29.65	29.66	29.78	29.83	29.77	29.71	29.70	29.58
Little Rock, Ark	29.71	29.58	29.59	29.48	29.69	29.73	29.82	29.73	29.78	29.74	29.73	29.61
Galveston, Tex	29.80	29.67	29.67	29.59	29.72	29.81	29.88	29.78	29.71	29.81	29.74	29.77
Indianola, Tex	29.78	29.66	29.66	29.58	29.70	29.79	29.87	29.82	29.79	29.82	29.75	29.76
Palestine, Tex	29.86	29.69	29.67	29.55	29.70	29.76	29.87	29.86	29.83	29.80	29.80	29.68
Rio Grande Valley:												
Brownsville, Tex	29.78	29.64	29.65	29.54	29.67	29.71	29.83	29.78	29.78	29.76	29.74	29.73
Rio Grande City, Tex	29.79	29.59	29.64	29.54	29.60	29.75	29.78	29.68	29.77	29.78	29.73	29.74
Ohio Valley and Tennessee:												
Chattanooga, Tenn	29.69	29.65	29.59	29.62	29.71	29.73	29.79	29.80	29.74	29.81	29.80	29.77
Knoxville, Tenn	29.64	29.57	29.52	29.56	29.58	29.71	29.76	29.80	29.74	29.77	29.66	29.61
Memphis, Tenn	29.69	29.55	29.56	29.52	29.67	29.72	29.82	29.77	29.78	29.76	29.65	29.65
Nashville, Tenn	29.64	29.52	29.51	29.52	29.64	29.70	29.78	29.77	29.74	29.77	29.67	29.64
Louisville, Ky	29.54	29.48	29.42	29.48	29.62	29.60	29.72	29.72	29.71	29.68	29.57	29.57
Indianapolis, Ind	29.52	29.45	29.38	29.43	29.53	29.55	29.68	29.71	29.68	29.62	29.50	29.52
Cincinnati, Ohio	29.54	29.48	29.38	29.48	29.59	29.59	29.70	29.72	29.72	29.66	29.54	29.55
Columbus, Ohio	29.54	29.50	29.40	29.46	29.58	29.58	29.64	29.71	29.69	29.67	29.57	29.65
Pittsburg, Pa	29.47	29.43	29.35	29.42	29.52	29.59	29.66	29.68	29.68	29.55	29.44	29.47

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Lower Lakes:	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Buffalo, N. Y.	29.42	29.39	29.28	29.37	29.50	29.54	29.56	29.61	29.57	29.45	29.43	29.40
Oswego, N. Y.	29.42	29.41	29.24	29.41	29.53	29.57	29.58	29.62	29.58	29.45	29.36	29.36
Rochester, N. Y.	29.42	29.40	29.26	29.40	29.51	29.55	29.56	29.60	29.59	29.46	29.35	29.37
Erie, Pa.	29.45	29.40	29.29	29.38	29.52	29.55	29.60	29.64	29.60	29.47	29.39	29.43
Cleveland, Ohio	29.49	29.42	29.35	29.41	29.52	29.54	29.65	29.67	29.66	29.53	29.42	29.48
Sandusky, Ohio	29.52	29.43	29.36	29.39	29.57	29.52	29.62	29.69	29.65	29.62	29.49	29.49
Toledo, Ohio	29.48	29.41	29.28	29.38	29.50	29.56	29.62	29.66	29.63	29.54	29.42	29.47
Detroit, Mich	29.48	29.38	29.27	29.35	29.48	29.49	29.60	29.63	29.61	29.49	29.38	29.43
Upper Lakes:												
Alpena, Mich	29.38	29.31	29.26	29.30	29.45	29.45	29.56	29.57	29.47	29.34	29.37	29.31
Escanaba, Mich	29.39	29.33	29.29	29.32	29.46	29.41	29.55	29.60	29.47	29.32	29.38	29.30
Grand Haven, Mich	29.45	29.38	29.25	29.31	29.50	29.49	29.62	29.66	29.59	29.46	29.38	29.40
Mackinaw City, Mich	29.32	29.46	29.22	29.30	29.50	29.60	29.48	29.56	29.41	29.50	29.48	29.41
Marquette, Mich	29.41	29.34	29.29	29.31	29.45	29.40	29.46	29.57	29.49	29.29	29.39	29.32
Port Huron, Mich	29.44	29.37	29.26	29.34	29.48	29.50	29.57	29.61	29.59	29.49	29.36	29.42
Chicago, Ill	29.48	29.41	29.28	29.33	29.49	29.49	29.62	29.69	29.58	29.49	29.45	29.44
Milwaukee, Wis	29.43	29.37	29.26	29.31	29.49	29.47	29.62	29.65	29.58	29.45	29.40	29.39
Duluth, Minn	29.40	29.41	29.35	29.34	29.44	29.42	29.53	29.58	29.50	29.32	29.46	29.40
Upper Mississippi Valley:												
Saint Paul, Minn	29.42	29.41	29.33	29.34	29.38	29.37	29.53	29.55	29.50	29.32	29.45	29.41
La Crosse, Wis	29.48	29.44	29.30	29.32	29.45	29.46	29.60	29.62	29.55	29.47	29.46	29.41
Davenport, Iowa	29.52	29.40	29.39	29.36	29.49	29.52	29.65	29.71	29.67	29.49	29.45	29.48
Des Moines, Iowa	29.51	29.44	29.36	29.36	29.48	29.44	29.66	29.70	29.60	29.48	29.56	29.50
Dubuque, Iowa	29.52	29.45	29.29	29.35	29.49	29.49	29.65	29.68	29.62	29.45	29.44	29.44
Keokuk, Iowa	29.50	29.39	29.31	29.36	29.47	29.51	29.63	29.70	29.63	29.48	29.46	29.47
Cairo, Ill	29.65	29.51	29.49	29.48	29.65	29.67	29.78	29.78	29.77	29.71	29.66	29.61
Springfield, Ill	29.59	29.46	29.35	29.46	29.57	29.57	29.72	29.76	29.71	29.61	29.63	29.48
Saint Louis, Mo	29.59	29.46	29.41	29.42	29.55	29.61	29.71	29.76	29.72	29.62	29.55	29.55
Missouri Valley:												
Leavenworth, Kans	29.53	29.40	29.37	29.34	29.40	29.50	29.64	29.68	29.61	29.46	29.50	29.50
Omaha, Nebr	29.46	29.39	29.32	29.29	29.33	29.42	29.56	29.63	29.54	29.45	29.50	29.51
Bennett, Fort, Dak	29.58	29.51	29.44	29.45	29.32	29.50	29.58	29.50	29.54	29.53	29.59	29.61
Huron, Dak	29.59	29.51	29.40	29.48	29.32	29.52	29.54	29.51	29.55	29.48	29.61	29.59
Yankton, Dak	29.48	29.45	29.35	29.35	29.32	29.43	29.53	29.57	29.50	29.40	29.50	29.55
Extreme Northwest:												
Moorhead, Minn	29.50	29.54	29.48	29.54	29.43	29.52	29.56	29.50	29.52	29.38	29.58	29.56
Saint Vincent, Minn	29.42	29.45	29.37	29.51	29.48	29.53	29.45	29.43	29.44	29.36	29.49	29.51
Bismarck, Dak	29.38	29.45	29.31	29.40	29.32	29.42	29.45	29.47	29.44	29.38	29.44	29.47
Buford, Fort, Dak	29.40	29.43	29.42	29.39	29.39	29.45	29.49	29.45	29.44	29.41	29.44	29.52
Northern Slope:												
Assinaboine, Fort, Mont	29.67	29.64	29.60	29.50	29.63	29.65	29.60	29.58	29.64	29.60	29.70	29.58
Benton, Fort, Mont	29.49	29.57	29.49	29.48	29.59	29.65	29.64	29.72	29.65	29.60	29.63	29.55
Custer, Fort, Mont	29.76	29.52	29.58	29.51	29.58	29.55	29.51	29.64	29.63	29.59	29.80	29.72
Helena, Mont	29.78	29.59	29.65	29.51	29.62	29.61	29.65	29.68	29.72	29.67	29.89	29.70
Maginnis, Fort, Mont	29.83	29.80	29.61	29.50	29.60	29.66	29.65	29.68	29.74	29.56	29.79	29.63
Shaw, Fort, Mont	29.71	29.62	29.68	29.48	29.62	29.62	29.61	29.64	29.64	29.58	29.78	29.60
Deadwood, Dak	29.71	29.66	29.58	29.51	29.41	29.51	29.57	29.64	29.65	29.63	29.57	29.72
Cheyenne, Wyo	29.51	29.55	29.50	29.45	29.52	29.65	29.78	29.79	29.73	29.59	29.66	29.58
North Platte, Nebr	29.23	29.26	29.06	28.99	28.99	29.20	29.26	29.29	29.27	29.18	29.31	29.32
Middle Slope:												
Denver, Colo	29.53	29.54	29.49	29.44	29.50	29.62	29.75	29.73	29.69	29.62	29.68	29.60
Pike's Peak, Colo	29.48	29.49	29.46	29.43	29.55	29.76	30.00	29.95	29.82	29.63	29.61	29.49
West Las Animas, Colo	29.68	29.50	29.57	29.26	29.32	29.50	29.56	29.54	29.57	29.54	29.72	29.64
Dodge City, Kans	29.32	29.22	29.10	29.06	29.04	29.28	29.38	29.40	29.34	29.29	29.33	29.30
Elliott, Fort, Tex	29.39	29.31	29.33	29.17	29.22	29.49	29.60	29.72	29.67	29.67	29.72	29.52
Southern Slope:												
Sill, Fort, Ind. T	29.54	29.43	29.38	29.26	29.40	29.49	29.66	29.62	29.61	29.54	29.54	29.46
Concho, Fort, Tex	29.47	29.40	29.42	29.28	29.40	29.50	29.56	29.61	29.57	29.56	29.59	29.57
Davis, Fort, Tex	29.88	29.84	29.80	29.75	29.79	29.81	29.93	29.92	29.85	29.84	29.90	29.90
Stockton, Fort, Tex	29.71	29.66	29.59	29.49	29.66	29.67	29.79	29.80	29.76	29.74	29.73	29.78
Southern Plateau:												
Santa Fé, N. Mex	29.38	29.43	29.46	29.40	29.47	29.61	29.73	29.74	29.71	29.59	29.58	29.42
El Paso, Tex	29.89	29.81	29.78	29.62	29.59	29.62	29.71	29.74	29.68	29.75	29.84	29.88
Apache, Fort, Ariz	29.94	29.94	29.89	29.86	29.85	29.72	29.83	29.83	29.79	29.75	29.79	29.90
Grant, Fort, Ariz	29.79	29.77	29.77	29.71	29.74	29.75	29.83	29.79	29.77	29.77	29.79	29.80
Prescott, Ariz	29.78	29.73	29.77	29.72	29.77	29.76	29.84	29.82	29.80	29.79	29.82	29.82
Thomas, Camp, Ariz	29.81	29.76	29.76	29.65	29.64	29.61	29.64	29.68	29.61	29.62	29.88	29.75
Yuma, Ariz	29.77	29.70	29.71	29.66	29.61	29.56	29.59	29.58	29.62	29.64	29.64	29.65
Middle Plateau:												
Winnemucca, Nev	29.64	29.65	29.58	29.56	29.65	29.69	29.71	29.71	29.76	29.67	29.76	29.71
Salt Lake City, Utah	29.60	29.59	29.54	29.50	29.58	29.59	29.65	29.68	29.64	29.61	29.69	29.64
Northern Plateau:												
Boisé City, Idaho	29.64	29.64	29.60	29.56	29.68	29.66	29.59	29.62	29.66	29.61	29.72	29.70
Lewiston, Idaho	29.56	29.45	29.40	29.50	29.53	29.61	29.65	29.65	29.60	29.51	29.66	29.40

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Northern Plateau—Continued:	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Dayton, Wash	29.57	29.46	29 44	29.54	29.60	29.71	29.78	29.77	20.78	29.56	29.72	29.48
Spokane Falls, Wash	29.63	29.42	29.43	29.46	29.59	29.66	29.70	29.72	29.70	29.54	29.68	29.47
North Pacific Coast:												
Olympia, Wash	29.35	29.34	29.33	29.50	29.66	39.72	29.75	29.74	29.57	29.40	29.44	29.34
Tatoosh Island, Wash	29 44	29.21	29.40	29.46	29.74	29.74	29.80	29.77	29.26	29.48	29.56	29.12
Portland, Oreg	29.35	29.53	29.47	29.60	29.71	29.76	29.80	29.80	29.71	29.50	29.52	29.51
Roseburg, Oreg......	29.49	29.51	29.47	29.55	29.71	29.77	29.79	29.78	29.70	29.57	29.61	29.55
Middle Pacific Coast:												
Cape Mendocino, Cal.	29.59	29.40	29.24	29.48	29.74	29.74	29.81	29.82	29.68	29.61	29.81	29.50
Red Bluff, Cal	29.66	29.63	29.58	29.64	20.73	29.64	29.63	29.64	29.69	29.68	29.77	29.60
Sacramento, Cal	29.73	29 68	29.66	29.68	29.75	29.70	29.70	29.69	29.71	29.73	29.79	29.66
San Francisco, Cal..	29.65	29.68	29.73	29.75	29.81	29.78	29.78	29.78	29.76	29.77	29.79	29.69
South Pacific Coast:												
Los Angeles, Cal....	29.79	29.76	29.84	29.82	29.82	29.81	29.80	29.78	29.77	29.78	29.76	29.76
San Diego, Cal	29.81	29.70	29.84	29.85	29.83	29.82	29.82	29.80	29.77	29.82	29.83	29.80
Alaska Stations:												
Saint Michael's, Fort, Alaska	28.82	20.22	29.30	29.15	29.17	29.42	29.42	29.33	29.15	29.07	28.92	29.05
Sitka, Alaska	29.13	29.02	29.25	29.18	29.32	29.45	29.62	29.55	29.26	29.04	28.92	28.74
Unalashka, Alaska ..	28.39	29.09	29.10	29.00	29.05	29.20	29.40	29.12	28.90	28.70	28.52	28.61
Behring's Island, Behring Sea	28.78	29.00	29.03	29.18	29.13	29.45	29.46	29.30	29.02	28.89	28.43	28.70

APPENDIX 8.

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including July, 1872.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°
Mount Washington, N. H ..	3.6	5.6	—0.7	21.0	33.3	42.5	47.2	47.6	36.6	20.8	11.8	3.8	.....
Boston, Mass	26.7	28.4	34.2	46.8	58.1	67.0	72.8	71.7	59.3	54.0	39.6	30.1	48.9
New London, Conn	27.0	27.2	33.4	46.2	56.6	65.6	72.2	70.9	58.4	54.1	36.4	27.9	.....
Middle Atlantic States:													
New York City	29.9	31.0	36.2	50.4	61.0	69.8	74.0	73.0	60.8	54.9	43.8	32.1	51.6
Philadelphia, Pa	82.2	84.1	40.2	54.2	64.6	71.4	76.8	76.9	62.6	56.5	40.0	80.2	54.5
Cape May, N. J	30.9	30.2	33.3	47.9	58.4	68.0	73.2	75.0	63.8	58.8	42.4	32.8	....
Baltimore, Md	84.6	37.8	42.2	57.0	66.3	74.6	78.6	77.2	63.4	58.2	44.7	33.5	56.1
Washington City	82.2	34.8	41.7	57.1	65.6	74.3	77.6	76.8	62.3	58.1	43.4	33.0	54.8
Lynchburg, Va	33.8	34.8	39.0	57.2	66.9	73.2	75.8	75.9	62.1	57.1	43.5	35.4	....
Norfolk, Va	41.0	41.6	48.1	61.1	70.0	75.6	79.0	79.3	67.5	62.4	48.9	41.0	60.6
South Atlantic States:													
Wilmington, N. C	44.7	48.7	54.2	64.4	72.6	79.4	82.8	80.2	70.1	64.7	55.6	45.6	64.8
Charleston, S. C	41.7	51.4	57.3	66.1	73.8	80.2	83.5	79.6	72.6	68.5	58.1	48.6	65.5
Savannah, Ga	48.0	53.2	57.8	67.5	74.0	79.6	82.0	79.3	71.6	68.0	58.5	49.8	66.6
Florida Peninsula:													
Key West, Fla	68.2	71.0	73.7	77.6	79.4	82.8	82.8	84.2	82.4	80.3	74.7	69.2	77.2
Eastern Gulf States:													
Mobile, Ala	47.6	55.0	58.1	68.4	74.4	80.7	81.5	83.0	74.9	68.7	57.9	51.9	67.5
New Orleans, La	50.8	57.9	61.8	69.8	74.4	81.2	82.8	82.8	75.8	70.7	60.1	51.6	69.2
Western Gulf States:													
Galveston, Tex	49.7	55.8	60.8	71.8	77.2	82.8	86.0	85.1	78.8	71.[illegible]	60.3	56.0	.....
Ohio Valley and Tennessee:													
Knoxville, Tenn	35.1	41.8	46.7	59.8	66.3	73.8	76.8	78.3	66.3	57.6	45.9	36.6	58.0
Memphis, Tenn	45.4	42.3	51.2	63.4	71.0	79.8	79.8	82.3	68.2	61.9	48.5	39.1	.....
Nashville, Tenn	38.0	40.7	49.9	63.4	70.2	77.7	79.6	80.4	68.7	61.0	46.4	42.4	.....
Indianapolis, Ind	26.6	29.6	41.1	56.3	65.2	73.7	76.0	75.8	62.3	57.1	38.6	27.5	.....
Cincinnati, Ohio	33.6	36.4	44.2	58.2	65.8	74.7	78.2	79.4	64.7	58.5	43.3	33.2	.....
Pittsburg, Pa	27.8	30.5	39.0	54.4	63.5	72.0	73.4	73.3	59.5	54.8	38.2	30.2	.....
Lower Lakes:													
Buffalo, N. Y	26.6	27.4	34.0	46.9	55.4	66.2	71.1	70.7	58.2	52.3	34.7	28.8	48.8
Oswego, N. Y	25.0	24.6	31.4	45.0	54.0	64.4	70.1	70.2	57.7	58.5	35.8	28.2	47.1
Rochester, N. Y	23.5	24.0	30.6	45.8	56.4	65.8	70.2	70.0	56.2	53.1	35.8	26.8	47.1
Cleveland, Ohio	27.4	27.9	35.4	50.2	58.8	65.8	72.4	71.2	60.1	54.8	39.4	27.6	50.0
Toledo, Ohio	26.3	26.2	35.1	50.4	60.4	69.8	73.7	71.5	59.8	54.5	34.4	23.5	49.5
Detroit, Mich	24.5	25.0	32.4	45.8	57.1	66.8	71.0	69.8	58.2	53.7	33.3	24.9	47.2
Upper Lakes:													
Escanaba, Mich	15.9	16.3	15.6	36.1	46.5	62.0	65.6	65.0	53.7	46.8	31.6	13.2	.....
Grand Haven, Mich	24.2	21.0	23.4	46.4	52.2	65.0	69.8	68.6	56.4	51.2	32.8	22.8	.....
Marquette, Mich	18.6	17.2	15.7	38.1	46.9	61.2	64.0	65.6	55.8	46.0	29.9	13.7	.....
Chicago, Ill	27.0	27.8	34.4	50.0	56.5	62.2	72.4	72.7	61.0	(1)	35.0	20.0	.....
Milwaukee, Wis	22.8	24.0	29.3	44.0	53.6	65.6	68.8	69.7	58.1	48.3	36.8	20.8	45.2
Duluth, Minn	18.2	17.1	22.0	37.7	49.4	60.8	66.2	62.5	56.0	44.7	31.0	14.8	39.4
Upper Mississippi Valley:													
Saint Paul, Minn	15.2	20.1	31.1	45.6	58.6	67.4	70.6	68.2	58.2	46.7	33.6	15.9	43.6
Keokuk, Iowa	24.9	31.0	34.4	54.0	64.4	75.2	78.4	75.6	63.8	57.0	35.4	25.2	.....
Cairo, Ill	31.2	37.0	42.5	62.0	68.3	75.5	79.8	79.5	67.2	60.4	43.4	34.8	.....
Saint Louis, Mo	33.0	36.0	44.4	58.9	68.1	78.0	79.5	78.1	66.0	50.0	39.8	30.2	57.5
Missouri Valley:													
Leavenworth, Kans	24.7	30.9	36.3	56.6	64.5	76.9	77.9	72.8	70.7	56.2	36.4	24.1	.....
Omaha, Nebr	21.6	28.9	36.0	52.2	62.2	74.1	75.8	73.5	62.2	53.2	30.7	18.8	50.1
Northern Slope:													
Cheyenne, Wyo	27.4	30.5	33.2	39.3	52.6	63.3	65.8	65.4	57.4	44.8	33.8	24.1	45.6
Middle Pacific Coast:													
San Francisco, Cal	52.2	54.2	52.8	53.4	55.1	58.0	57.2	57.9	60.4	61.8	54.9	52.9	.....

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[1] No record.

APPENDIX 9.

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (*Computed from September*, 1872, *to and including October*, 1879, *except at stations opened subsequent to the former date.*)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.00 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me	19.3	22.1	29.0	37.9	47.5	54.6	60.3	60.5	55.2	47.3	34.8	24.4	41.2
Portland, Me	22.4	25.0	33.2	42.7	54.8	63.7	69.6	67.6	60.0	50.1	36.8	29.0	46.4
Mount Washington, N. H	4.9	5.5	12.8	20.8	33.0	44.0	48.3	46.9	40.0	30.3	16.4	8.1	26.1
Burlington, Vt	18.6	20.1	29.2	41.8	55.5	66.2	71.1	68.6	60.2	48.9	34.5	22.7	45.0
Boston, Mass	25.9	27.1	34.5	43.2	56.5	66.2	72.0	69.2	62.1	52.0	38.7	28.8	48.2
Wood's Holl, Mass	30.2	30.5	35.6	42.9	52.9	62.5	68.8	68.6	62.7	54.9	42.7	34.3	48.9
New Haven, Conn	28.2	29.4	36.1	45.9	58.7	68.4	73.8	71.1	64.0	54.0	40.6	30.5	50.2
New London, Conn	28.4	29.1	35.7	44.7	56.3	65.7	71.6	69.9	63.1	53.3	40.5	31.1	49.3
Middle Atlantic States:													
Albany, N. Y	21.7	22.4	31.3	43.1	57.6	67.4	71.6	70.0	61.3	49.8	37.2	26.2	46.7
New York City	29.8	30.4	37.2	46.0	58.4	68.6	74.0	72.1	65.1	55.3	41.9	32.4	51.0
Philadelphia, Pa	31.1	32.1	39.2	48.4	61.0	71.2	76.4	73.1	65.8	55.4	42.6	33.5	52.5
Atlantic City, N. J	31.4	32.7	38.4	46.0	56.9	66.8	72.0	72.2	66.1	56.0	44.0	34.6	51.5
Barnegat City, N. J	30.6	31.5	37.8	45.4	57.0	66.7	72.2	72.0	65.6	55.4	43.5	33.6	51.1
Cape May, N. J	33.9	34.2	40.2	47.6	57.9	68.3	73.2	73.1	67.4	58.0	45.5	36.7	53.1
Sandy Hook, N. J	30.5	30.8	37.3	45.3	58.1	68.5	74.2	72.8	65.8	56.0	44.3	34.0	51.5
Baltimore, Md	34.3	35.9	42.2	51.9	63.6	74.0	79.2	74.9	67.4	56.8	44.6	36.4	55.2
Washington City	33.6	35.2	42.7	51.9	63.6	73.9	79.1	74.1	67.1	57.3	43.7	35.5	54.8
Cape Henry, Va	40.8	41.6	47.5	53.9	63.4	73.4	78.4	76.3	71.0	61.9	51.2	42.3	58.6
Lynchburg, Va	36.8	39.7	46.8	55.6	63.5	74.7	80.2	75.3	68.3	57.1	45.3	37.7	57.0
Norfolk, Va	40.6	41.6	48.3	55.2	65.2	75.8	80.1	76.6	70.2	59.6	48.8	40.8	58.7
South Atlantic States:													
Cape Hatteras, N. C	45.3	45.6	51.6	56.6	64.7	73.7	78.8	77.7	72.7	64.3	55.7	47.1	61.4
Charlotte, N. C	41.0	40.7	54.6	58.6	68.6	74.9	79.0	73.6	68.0	65.0	49.4	38.1	..
Kitty Hawk, N. C	42.0	41.8	48.9	54.6	63.1	72.8	78.9	77.2	71.5	62.5	52.4	43.1	59.6
Smithville, N. C	46.5	47.9	55.0	61.2	68.7	76.6	81.4	80.0	74.2	65.2	55.3	46.5	63.3
Wilmington, N. C	46.4	47.8	54.6	61.0	68.5	75.7	80.3	78.0	73.1	62.5	53.2	46.0	62.4
Charleston, [illegible]. C	49.9	51.3	57.7	64.0	72.3	70.3	82.7	80.8	76.1	65.6	56.7	49.6	65.5
Augusta, Ga	47.4	49.3	56.4	63.3	72.6	78.8	82.3	79.7	74.4	62.8	52.9	45.8	63.9
Savannah, Ga	51.6	53.0	59.6	66.1	73.8	80.0	82.8	80.8	75.8	65.4	57.1	50.7	66.4
Jacksonville, Fla	55.6	57.0	62.7	68.7	75.4	80.4	82.8	80.9	77.8	68.0	60.8	54.3	68.9
Florida Peninsula:													
Key West, Fla	69.6	71.3	73.5	76.5	80.1	83.0	83.6	84.3	83.0	78.5	74.1	69.5	77.3
Punta Rasa, Fla	64.1	65.8	68.6	72.2	76.7	80.3	81.3	81.2	80.1	74.8	69.0	63.6	73.3
Eastern Gulf States:													
Atlanta, Ga	44.1	43.7	57.0	59.5	70.2	75.3	79.8	73.4	69.1	61.6	52.9	40.6	.....
Mobile, Ala	50.3	53.6	59.9	65.9	74.5	80.7	83.0	80.5	76.7	66.3	57.4	51.1	66.8
Montgomery, Ala	48.4	51.6	57.7	64.0	73.6	79.5	83.1	80.5	75.2	63.9	54.3	48.0	65.2
Vicksburg, Miss	47.6	52.0	59.4	64.4	73.3	79.6	82.3	80.0	75.1	64.8	54.7	49.1	65.3
New Orleans, La	53.9	57.3	63.0	67.6	74.9	80.8	82.7	81.9	77.8	69.2	60.7	54.6	68.7
Western Gulf States:													
Shreveport, La	46.1	51.4	59.7	64.8	73.7	80.4	83.2	82.0	74.9	65.4	54.6	48.8	65.5
Fort Gibson, Ind. T	36.4	42.7	51.0	58.7	69.0	76.1	81.4	79.7	71.5	59.5	47.3	39.6	59.4
Corsicana, Tex	44.7	51.5	59.5	65.4	73.1	79.3	84.2	82.5	75.9	66.8	55.0	48.5	64.9
Denison, Tex	43.1	49.2	56.8	64.2	71.6	77.4	82.7	80.4	73.8	63.7	51.1	44.4	62.8
Galveston, Tex	52.5	57.0	64.2	68.6	76.2	82.4	[illegible]	83.3	79.4	71.7	61.8	55.2	69.8
Indianola, Tex	52.6	57.9	65.4	69.1	76.0	81.9	83.9	83.0	79.2	72.1	61.9	55.1	69.9
San Antonio, Tex	51.6	55.2	66.5	70.7	77.2	81.5	83.6	83.5	78.8	71.4	58.4	52.3	68.8
Rio Grande Valley:													
Brownsville, Tex	58.0	61.6	69.8	75.0	80.3	83.8	85.4	84.2	80.0	75.7	65.6	57.6	72.7
Rio Grande City, Tex	58.9	61.2	74.5	78.1	83.2	85.4	87.9	83.3	79.8	73.2	67.5	54.7	.....
Ohio Valley and Tennessee:													
Knoxville, Tenn	37.2	40.4	47.9	56.2	66.4	73.3	77.4	74.3	67.8	56.1	45.1	38.3	56.7
Memphis, Tenn	40.0	44.3	52.2	59.8	70.8	77.7	82.1	78.7	71.0	59.9	49.0	41.6	60.7
Nashville, Tenn	38.6	42.5	49.8	58.6	69.8	77.4	81.7	78.2	70.3	58.7	47.8	40.3	59.6
Louisville, Ky	34.2	37.6	45.0	55.1	66.8	75.4	80.1	76.3	68.1	57.0	44.1	37.3	56.6
Indianapolis, Ind	29.6	33.2	40.3	51.9	63.9	72.6	77.3	73.8	65.2	54.3	40.4	33.3	53.2
Cincinnati, Ohio	33.5	36.5	43.2	53.6	65.6	74.5	79.1	75.0	67.4	56.3	43.8	36.8	55.6
Columbus, Ohio	25.4	29.0	41.4	50.5	65.1	71.7	78.9	72.6	63.2	57.2	42.7	26.4	.....
Morgantown, W. Va	33.8	35.3	41.2	50.8	62.1	71.1	75.2	71.3	64.1	53.6	41.8	36.1	53.1
Pittsburg, Pa	30.0	31.5	38.3	48.1	60.8	71.1	75.2	71.4	63.7	52.6	39.4	32.4	51.3
Lower Lakes:													
Buffalo, N. Y	24.4	24.0	30.6	40.5	53.2	65.0	70.3	69.1	61.6	50.4	38.8	28.3	46.2
Oswego, N. Y	26.1	25.5	32.5	42.6	54.6	65.1	71.0	69.9	62.4	51.2	38.6	29.7	47.5
Rochester, N. Y	23.9	24.0	31.1	42.6	56.5	66.8	71.5	69.4	61.3	49.9	35.7	27.4	46.8
Erie, Pa	27.7	27.3	34.1	43.7	57.7	68.6	73.3	71.1	63.6	52.9	40.1	32.5	49.5

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Lower Lakes—Cont'd.													
Cleveland, Ohio	26.8	27.2	34.2	44.2	58.0	67.9	72.5	70.8	63.2	52.4	38.6	30.1	48.9
Sandusky, Ohio	28.6	30.4	40.8	50.5	59.8	66.9	75.0	72.9	64.1	56.5	42.8	34.5	52.0
Toledo, Ohio	27.4	29.4	36.1	47.1	57.6	70.3	74.5	71.5	63.4	52.6	38.9	30.8	50.1
Detroit, Mich	23.7	25.8	32.1	43.7	57.4	67.3	71.9	70.0	61.8	50.4	36.2	27.7	47.4
Upper Lakes:													
Alpena, Mich	18.4	18.3	24.4	36.2	48.7	59.9	66.2	64.7	56.8	44.8	32.1	23.5	41.2
Escanaba, Mich	14.8	16.4	23.8	35.5	49.3	60.0	67.6	65.5	56.2	44.2	31.2	21.4	40.4
Grand Haven, Mich	25.8	25.8	32.0	43.3	55.5	64.7	70.1	68.6	60.6	50.0	37.0	29.8	47.0
Marquette, Mich	17.4	19.3	25.8	37.2	49.7	59.0	66.5	66.0	56.7	45.8	31.7	23.2	41.5
Port Huron, Mich	21.6	22.8	29.9	41.6	53.8	63.2	69.6	68.8	60.2	49.6	36.3	26.8	45.2
Chicago, Ill	25.0	28.8	35.6	45.0	56.8	66.8	73.1	71.9	63.5	51.9	37.9	29.7	49.0
Milwaukee, Wis	19.7	23.8	30.6	41.3	53.0	63.1	69.7	68.9	60.8	47.0	33.9	24.9	44.6
Duluth, Minn	11.8	18.1	25.4	38.5	49.0	57.7	67.4	67.2	56.2	44.8	28.9	18.0	40.4
Upper Mississippi Valley:													
Saint Paul, Minn	18.9	18.6	28.0	44.1	58.6	67.3	73.1	70.1	58.2	46.4	30.2	20.6	43.8
La Crosse, Wis	16.8	22.3	31.9	46.5	60.4	68.6	74.4	71.5	60.7	49.4	32.9	23.2	46.6
Davenport, Iowa	20.8	26.9	35.6	48.4	61.8	70.6	75.9	73.5	63.6	51.9	35.7	26.9	49.3
Des Moines, Iowa	18.9	25.2	39.6	50.7	62.7	69.9	77.4	75.6	63.8	55.0	42.0	19.8	.....
Dubuque, Iowa	19.3	25.0	33.6	47.9	61.4	68.7	75.7	72.8	62.3	51.2	34.6	26.7	48.3
Keokuk, Iowa	24.8	30.5	38.7	50.5	68.2	72.6	78.2	75.4	65.9	54.2	37.9	29.2	51.8
Cairo, Ill	35.8	40.1	48.2	57.4	68.0	75.1	80.0	77.6	69.2	58.4	45.2	38.0	57.8
Saint Louis, Mo	33.1	36.1	43.5	54.0	66.0	74.5	79.7	76.6	67.3	57.0	42.2	34.7	55.5
Missouri Valley:													
Leavenworth, Kans	25.7	32.8	41.4	52.6	65.3	73.8	78.7	77.3	66.3	55.3	39.5	30.8	53.2
Omaha, Nebr	21.0	27.8	36.2	49.2	62.3	70.7	76.7	74.8	62.9	52.4	35.7	26.4	49.5
Yankton, Dak	14.9	21.4	30.1	45.2	59.4	67.9	74.1	72.2	60.8	48.8	31.8	21.8	45.3
Extreme Northwest:													
Breckenridge, Minn	2.9	8.4	19.2	39.4	55.3	63.8	69.1	66.3	54.0	42.9	23.2	11.5	37.9
Bismarck, Dak	6.3	11.8	22.1	41.4	54.7	62.3	70.6	67.9	55.8	43.5	24.2	17.3	39.8
Pembina, Dak	−0.2	7.4	15.1	35.9	52.9	61.8	67.2	64.2	52.0	39.0	19.0	8.6	36.0
Northern Slope:													
Benton, Fort, Mont	8.8	17.8	24.0	43.9	56.6	63.2	72.0	69.1	56.8	47.1	24.0	22.8	42.6
Cheyenne, Wyo	24.3	29.0	33.6	39.2	51.3	61.4	68.3	65.8	55.2	44.5	33.6	27.1	44.2
North Platte, Nebr	20.0	28.7	35.6	47.3	58.9	67.8	74.5	72.4	61.4	49.7	35.1	27.6	47.6
Middle Slope:													
Denver, Colo	26.1	33.6	40.4	45.4	55.7	66.8	72.6	70.4	60.5	50.4	38.5	29.0	49.0
Pike's Peak, Colo	3.5	3.8	7.8	12.1	22.0	31.9	40.1	39.0	33.4	22.0	11.4	5.4	18.8
Dodge City, Kans	25.8	35.8	42.4	53.3	64.4	72.6	78.4	76.1	67.5	55.8	39.7	32.4	53.3
Southern Slope:													
Sill, Fort, Ind. T	36.4	43.9	55.5	62.1	70.7	76.9	81.7	79.4	72.9	63.0	48.8	37.1	60.6
Concho, Fort, Tex	43.8	48.3	61.0	66.3	76.4	79.9	83.8	80.4	74.0	65.8	51.2	43.6	63.7
Davis, Fort, Tex	49.7	51.4	59.7	64.0	72.6	74.6	76.2	72.8	68.8	62.4	55.1	39.1	.....
Stockton, Fort, Tex	44.6	49.6	59.6	66.8	76.2	78.6	81.6	79.4	73.3	64.0	50.8	43.1	62.9
Southern Plateau:													
La Mesilla, N. Mex	40.0	47.9	56.2	58.6	70.0	76.6	80.0	78.6	73.3	61.3	47.4	40.7	59.8
Santa Fé, N. Mex	28.7	32.1	40.2	44.9	55.9	65.2	68.2	66.3	59.4	49.8	37.6	30.0	47.9
El Paso, Tex	53.2	57.3	63.6	63.3	75.9	81.2	83.2	80.8	75.7	67.4	57.3	49.0	.....
Apache, Fort, Ariz	33.3	42.6	50.6	51.8	58.5	66.1	73.1	71.4	65.2	54.3	44.4	33.6	.....
Florence, Ariz	51.3	56.4	61.5	67.8	74.8	85.6	91.0	88.5	82.0	69.9	58.2	52.5	69.8
Grant, Fort, Ariz	45.1	52.9	60.7	59.2	68.6	76.1	79.8	77.6	73.7	64.2	52.1	44.2	.....
Prescott, Ariz	30.1	38.1	43.5	48.6	55.4	66.8	74.2	71.0	64.2	53.0	41.8	35.1	52.3
Tucson, Ariz	48.2	53.8	60.1	64.0	72.1	82.8	87.0	84.1	79.0	69.4	56.6	48.8	66.5
Yuma, Ariz	54.8	62.0	67.2	69.9	77.9	87.2	93.3	91.8	85.1	74.3	62.2	56.1	73.2
Middle Plateau:													
Pioche, Nev	29.4	35.8	45.2	47.0	54.1	64.0	72.4	72.6	63.8	50.9	41.3	32.6	50.1
Winnemucca, Nev	28.7	38.2	45.4	48.6	52.4	61.9	72.0	72.2	61.5	47.7	39.6	29.0	49.8
Salt Lake City, Utah	29.5	36.2	43.4	49.4	57.4	67.0	76.1	75.0	64.9	53.7	41.9	31.7	51.7
Northern Plateau:													
Boisé City, Idaho	30.5	40.0	47.7	52.0	55.9	66.8	73.8	78.9	62.1	49.0	42.0	31.0	52.4
Umatilla, Oreg	32.0	40.3	50.6	54.0	59.8	68.8	73.9	75.1	64.4	51.5	43.9	34.2	54.8
North Pacific Coast:													
Olympia, Wash	38.5	42.4	46.2	48.2	53.6	58.7	61.9	63.1	55.8	48.7	45.8	41.4	50.8
Portland, Oreg	39.8	43.8	47.7	52.5	56.0	61.9	67.2	66.1	61.5	54.0	45.8	41.8	53.3
Roseburg, Oreg	40.8	46.2	50.6	51.2	54.6	61.8	65.8	66.9	60.9	51.3	47.6	40.4	53.1
Middle Pacific Coast:													
Red Bluff, Cal	45.8	51.6	56.2	61.0	65.1	80.2	82.5	82.2	75.9	64.3	54.8	47.3	64.0
Sacramento, Cal	47.6	53.2	57.0	59.8	62.8	72.0	73.4	73.7	70.7	62.4	55.1	47.9	61.3
San Francisco, Cal	51.3	52.8	54.8	55.0	56.2	59.2	58.2	58.8	60.0	59.9	57.1	51.8	56.2
South Pacific Coast:													
Campo, Cal	41.0	45.5	49.5	51.6	55.4	63.3	68.2	68.5	64.0	56.7	48.7	44.8	54.2
Los Angeles, Cal	53.6	55.2	57.2	58.2	61.6	65.4	68.5	69.4	67.5	63.6	60.2	55.2	60.7
San Diego, Cal	54.6	55.0	56.1	57.9	60.8	64.3	67.5	68.9	66.9	63.5	59.2	55.3	60.9
Visalia, Cal	46.8	53.2	57.8	60.4	65.5	76.4	79.2	78.6	72.4	61.1	52.6	46.2	61.9
Alaska Stations:													
Saint Michael's, Fort, Alaska	8.4	−3.4	7.4	10.5	32.6	46.9	53.8	51.5	44.2	29.4	13.0	5.9	25.3

APPENDIX 10.

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time), observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	cember.	Annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me	19.8	23.2	27.9	37.8	47.1	56.2	60.5	61.1	56.5	46.7	36.1	25.7	41.6
Portland, Me	24.6	28.7	34.0	44.7	55.1	65.0	69.6	68.6	62.3	51.0	39.6	30.1	47.8
Mount Washington, N. H	6.1	8.8	9.6	20.1	34.2	44.3	46.7	47.2	42.6	30.2	17.2	11.3	26.5
Boston, Mass	26.4	30.1	33.9	48.6	55.3	65.8	69.9	68.8	63.5	51.7	40.0	31.4	48.4
Block Island, R. I	30.1	33.3	35.9	42.8	51.9	62.4	68.5	68.4	64.7	55.3	44.9	36.1	49.6
New Haven, Conn	26.5	30.6	34.5	45.2	57.3	66.9	70.9	69.5	65.0	53.0	40.8	31.8	49.3
New London, Conn	28.8	32.1	35.9	45.3	56.4	65.7	70.3	69.3	65.1	54.3	42.3	33.5	49.9
Middle Atlantic States:													
Albany, N. Y	25.0	30.0	34.8	47.8	61.2	70.1	73.2	71.9	65.9	53.0	40.4	30.4	50.4
New York City	30.0	33.6	36.7	47.0	59.3	68.3	72.6	71.6	67.5	56.2	43.2	34.4	51.6
Philadelphia, Pa	31.7	37.1	40.2	49.9	62.6	71.5	75.1	73.7	69.3	57.7	44.6	36.1	54.1
Atlantic City, N. J	32.4	35.7	38.6	46.7	57.8	66.9	72.6	71.6	68.8	58.5	44.5	36.8	52.5
Barnegat City, N. J	31.9	35.1	38.3	46.0	57.2	66.5	72.2	71.1	68.0	57.7	44.2	36.4	52.0
Cape May, N. J	34.8	39.0	41.4	48.9	60.0	68.5	74.1	72.9	70.1	60.6	48.0	39.4	54.7
Sandy Hook, N. J	30.8	34.1	37.6	47.1	59.5	68.8	74.0	72.8	69.0	57.9	45.0	35.8	52.7
Delaware Breakwater, Del	32.1	38.6	40.4	48.1	59.7	68.2	73.2	72.4	69.9	60.8	47.5	38.2	54.0
Baltimore, Md	34.4	39.7	42.5	52.6	65.3	73.6	76.9	74.7	70.2	59.6	46.0	38.3	56.1
Washington City	32.3	38.5	41.2	51.7	64.9	73.0	76.2	74.3	70.2	59.0	44.7	36.5	55.1
Cape Henry, Va	39.9	45.0	46.4	54.0	65.2	73.3	77.3	76.1	73.4	64.6	52.2	44.6	59.2
Chincoteague, Va	33.5	39.2	41.4	49.4	60.2	69.5	74.4	73.1	70.5	61.3	47.9	38.9	55.0
Lynchburg, Va	37.5	43.8	46.1	55.9	68.0	74.8	78.0	76.0	71.1	61.1	46.7	40.4	48.2
Norfolk, Va	40.7	46.6	48.0	55.6	67.6	75.2	78.9	76.7	73.1	63.7	51.2	44.6	60.1
South Atlantic States:													
Charlotte, N. C	41.5	48.3	50.4	58.8	69.0	76.1	79.4	76.7	71.8	63.3	49.8	43.8	60.6
Hatteras, N. C	48.2	48.8	50.0	55.2	66.0	74.2	78.2	77.4	75.3	67.6	56.2	47.3	61.8
Kitty Hawk, N. C	42.2	46.7	47.5	53.6	64.8	73.5	78.2	76.3	74.0	65.5	53.6	46.4	60.1
Macon, Fort, N. C	43.8	49.8	51.4	57.1	68.0	75.0	78.8	77.7	75.0	67.6	55.5	48.4	62.4
Smithville, N. C	47.8	51.9	53.9	60.2	70.2	77.0	80.7	78.8	74.8	66.8	54.6	49.4	63.7
Wilmington, N. C	48.3	53.5	55.0	61.2	70.1	76.7	79.9	78.2	74.6	67.0	55.1	50.2	64.1
Charleston, S. C	51.6	56.3	58.3	64.8	72.8	79.5	82.8	80.6	76.9	69.5	57.8	53.4	66.9
Augusta, Ga	48.8	54.9	57.3	64.1	72.4	78.7	81.9	79.5	75.6	68.2	54.8	50.2	65.5
Savannah, Ga	53.1	57.6	60.6	66.7	73.9	80.3	83.3	80.5	76.6	69.5	58.6	54.6	67.9
Jacksonville, Fla	57.4	61.4	64.2	69.6	74.9	80.7	82.9	81.0	77.7	72.6	62.5	58.4	70.2
Florida Peninsula:													
Cedar Keys, Fla	58.2	62.3	64.5	70.5	76.0	80.7	82.7	81.7	79.6	74.1	63.6	59.7	71.1
Key West, Fla	71.8	73.1	73.0	77.2	80.0	83.7	85.3	84.2	82.7	79.4	75.4	71.9	78.2
Sanford, Fla	55.6	65.3	68.4	70.8	75.5	78.6	82.4	80.4	78.0	74.8	67.1	64.0	71.6
Eastern Gulf States:													
Atlanta, Ga	44.1	50.0	53.0	61.0	69.1	75.4	78.5	75.8	72.0	65.1	51.2	46.1	61.7
Pensacola, Fla	54.1	58.4	61.8	67.9	73.9	79.7	81.0	80.8	77.3	71.9	59.4	55.4	68.4
Mobile, Ala	52.8	57.1	61.2	68.0	74.4	80.7	81.1	80.4	77.3	71.4	58.8	53.4	68.0
Montgomery, Ala	49.5	55.1	58.4	65.5	72.9	79.1	81.3	79.6	76.0	69.7	55.8	50.6	66.0
Vicksburg, Miss	49.0	54.9	59.4	66.4	73.1	79.9	81.3	80.3	75.4	68.9	55.3	51.8	66.2
New Orleans, La	55.9	60.5	63.9	70.0	75.6	81.1	83.0	82.0	78.9	73.2	61.4	57.4	70.2
Western Gulf States:													
Shreveport, La	46.8	52.1	58.9	66.8	73.6	81.0	83.1	81.7	75.3	68.4	54.4	50.0	65.8
Fort Smith, Ark	32.0	40.8	50.7	59.4	68.0	76.8	79.6	76.7	72.5	64.5	51.3	40.4	59.5
Little Rock, Ark	42.5	48.0	54.1	62.7	70.0	77.9	80.0	78.6	72.6	65.5	51.5	45.3	62.3
Galveston, Tex	53.6	58.3	64.0	69.9	76.3	82.4	84.0	83.4	80.1	74.7	62.2	57.8	70.5
Indianola, Tex	53.0	58.2	64.7	70.8	76.4	82.0	83.2	82.3	79.4	74.6	62.3	57.3	70.2
Palestine, Tex	42.0	54.0	60.8	65.2	70.6	78.6	81.5	79.6	75.8	68.7	56.7	49.7	65.0
Rio Grande Valley:													
Brownsville, Tex	58.6	62.9	68.8	74.1	78.8	82.6	83.4	82.2	79.4	75.5	65.4	61.8	72.6
Rio Grande City, Tex	57.6	64.4	69.7	76.2	80.3	85.3	86.8	83.1	82.5	74.8	63.6	60.2	73.1
Ohio Valley and Tennessee:													
Chattanooga, Tenn	41.9	48.0	51.5	60.0	68.2	75.0	77.6	75.9	71.1	63.8	49.6	43.6	60.4
Knoxville, Tenn	39.0	45.4	48.4	57.6	66.9	73.2	75.2	74.4	70.2	62.4	47.9	40.4	58.2
Memphis, Tenn	40.8	47.0	52.1	62.0	70.6	78.0	80.4	78.9	72.6	65.2	50.1	43.7	61.7

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Ohio Valley and Tennessee—Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°
Nashville, Tenn	39.6	45.8	49.7	59.6	69.2	76.2	78.2	77.4	71.5	64.1	48.6	41.6	60.0
Louisville, Ky	35.7	42.1	45.1	56.0	66.9	74.0	77.1	76.0	70.4	60.9	46.6	38.8	57.4
Indianapolis, Ind	29.5	35.5	40.1	51.9	64.0	72.5	75.3	74.1	67.6	57.0	41.5	32.4	53.3
Cincinnati, Ohio	34.8	41.0	44.2	54.3	65.6	73.8	77.0	75.6	70.4	60.2	45.3	37.6	56.5
Columbus, Ohio	29.5	35.8	39.1	50.0	62.8	70.8	74.1	72.5	67.4	56.2	41.2	33.2	52.6
Pittsburg, Pa	31.7	36.4	38.6	50.3	63.1	70.6	72.8	71.9	67.9	57.0	42.5	34.8	53.1
Lower Lakes:													
Buffalo, N. Y	24.0	26.6	29.4	40.1	53.6	63.8	68.1	68.5	63.9	51.5	38.6	30.2	46.5
Oswego, N. Y	25.7	28.9	31.6	41.9	54.9	63.7	68.7	68.6	63.5	51.4	39.4	30.4	47.4
Rochester, N. Y	24.3	27.3	30.3	42.0	56.3	64.9	68.8	69.0	65.1	50.9	37.6	29.0	47.5
Erie, Pa	27.4	30.7	33.1	43.6	57.5	66.3	70.8	69.7	64.9	54.5	40.9	32.7	49.2
Cleveland, Ohio	25.9	30.7	33.3	44.2	58.3	67.0	70.4	69.4	65.2	54.2	39.5	30.5	49.0
Sandusky, Ohio	27.4	32.0	35.1	45.6	60.7	68.5	72.2	71.4	66.4	55.0	40.6	31.8	50.8
Toledo, Ohio	27.3	32.0	36.0	46.9	60.4	69.3	73.1	71.4	66.2	54.8	40.8	31.8	50.8
Detroit, Mich	25.8	31.0	34.6	45.6	58.8	67.8	71.2	70.3	65.2	54.3	40.0	31.2	49.7
Upper Lakes:													
Alpena, Mich	18.0	19.6	24.1	36.1	49.2	59.0	64.3	64.0	58.0	46.3	32.2	23.6	41.2
Escanaba, Mich	14.0	16.3	22.6	35.7	50.1	61.0	65.3	64.1	57.6	46.3	30.7	21.0	40.5
Grand Haven, Mich	25.2	27.9	31.8	43.2	56.0	64.5	68.3	67.7	62.5	51.6	38.4	29.6	47.2
Mackinaw City, Mich	14.8	14.0	20.2	36.6	46.2	59.9	61.9	62.1	57.8	48.5	35.7	25.5	40.0
Marquette, Mich	16.5	17.7	23.5	36.5	49.5	58.1	63.8	63.2	56.9	46.0	30.8	22.2	40.5
Port Huron, Mich	21.5	25.6	29.0	40.1	53.3	62.8	67.0	67.3	62.3	50.2	35.6	26.9	45.1
Chicago, Ill	24.7	29.6	34.8	45.2	57.1	65.1	70.8	71.1	65.3	54.3	39.3	29.2	48.8
Milwaukee, Wis	20.4	25.8	31.1	42.3	54.2	62.1	67.8	68.1	61.6	51.5	35.6	25.0	45.5
Duluth, Minn	10.0	15.2	24.2	37.8	48.8	58.2	65.2	64.1	56.4	45.7	28.3	14.9	39.1
Upper Mississippi Valley:													
Saint Paul, Minn	12.4	18.4	28.6	44.9	58.5	67.0	69.9	69.6	59.9	48.6	31.0	17.6	43.9
La Crosse, Wis	16.0	22.7	31.0	47.0	60.7	69.1	71.5	70.8	62.7	51.4	34.2	21.6	46.6
Davenport, Iowa	22.9	28.9	35.4	49.5	62.0	69.8	73.6	72.7	65.5	54.5	39.1	28.0	50.2
Des Moines, Iowa	20.3	25.8	34.3	49.0	60.9	69.5	72.7	72.0	63.9	52.7	36.4	24.3	48.5
Dubuque, Iowa	19.0	25.0	33.0	47.8	60.6	68.4	72.0	71.1	63.3	52.1	35.8	24.2	47.8
Keokuk, Iowa	24.5	30.6	37.6	51.8	63.5	71.8	76.0	74.7	67.5	55.6	39.9	28.5	51.8
Cairo, Ill	35.9	42.5	47.6	58.8	68.1	75.9	78.5	77.3	70.7	62.2	47.4	39.1	58.5
Springfield, Ill	27.8	34.1	40.0	53.0	63.8	71.5	75.3	74.0	67.1	56.7	41.8	31.7	53.0
Saint Louis, Mo	29.7	36.0	42.1	54.9	65.2	73.3	77.0	76.1	70.1	59.0	44.0	34.1	55.1
Missouri Valley:													
Leavenworth, Kans	27.0	32.2	41.0	53.7	64.3	73.5	76.7	75.2	67.8	56.4	41.2	30.5	53.3
Omaha, Nebr	20.5	25.2	34.7	49.7	62.5	72.1	75.5	73.9	65.2	53.5	37.0	23.7	49.5
Bennett, Fort, Dak	10.4	16.2	28.4	43.0	56.5	68.2	70.8	71.8	60.1	46.3	29.2	18.3	43.6
Huron, Dak	9.8	14.4	27.7	43.6	52.8	66.3	68.8	68.6	58.0	46.8	30.4	17.8	41.8
Yankton, Dak	15.9	18.8	29.4	44.8	59.7	69.7	72.4	72.3	61.8	49.5	32.5	19.0	45.6
Extreme Northwest:													
Moorhead, Minn	−2.7	5.6	16.8	37.8	53.3	64.8	66.4	66.2	55.4	42.6	23.6	9.7	36.6
Saint Vincent, Minn	−6.8	1.5	12.7	33.5	51.2	62.1	63.4	63.4	52.4	39.6	19.3	4.5	33.2
Bismarck, Dak	5.4	10.9	21.2	38.5	55.2	65.3	67.8	67.7	55.8	43.0	25.9	10.0	39.0
Buford, Fort, Dak	5.1	10.2	22.1	39.2	53.7	64.3	66.5	66.7	53.7	41.4	24.9	8.0	38.1
Northern Slope:													
Assinaboine, Fort, Mont	10.5	13.4	28.6	41.4	52.5	63.5	66.2	65.7	53.2	40.5	28.5	16.9	40.3
Benton, Fort, Mont	16.0	19.4	33.4	41.8	53.2	63.2	68.8	68.6	55.5	41.8	30.3	19.9	42.6
Custer, Fort, Mont	17.4	20.4	31.7	44.0	54.5	64.5	70.0	70.0	57.0	45.2	31.5	18.1	43.6
Helena, Mont	15.0	19.7	33.4	41.4	51.6	61.1	66.6	67.2	56.0	42.2	29.6	20.4	42.6
Maginnis, Fort, Mont	17.4	13.6	28.8	37.6	47.6	59.4	61.5	63.5	51.5	39.5	32.9	20.1	38.8
Poplar River, Mont	2.2	−4.5	28.7	38.6	55.0	68.7	64.0	66.0	54.4	42.7	23.5	−2.0	36.3
Shaw, Fort, Mont	17.3	19.7	32.3	39.5	49.9	59.7	63.2	63.3	52.4	40.6	30.7	21.5	41.2
Deadwood, Dak	21.4	22.8	29.9	38.0	49.0	60.4	62.9	65.4	53.4	43.2	31.2	21.8	41.2
Cheyenne, Wyo	24.9	25.8	32.8	39.8	49.3	60.7	65.7	64.8	55.5	43.5	32.9	27.6	43.5
North Platte, Nebr	21.0	24.1	35.6	46.8	57.9	68.8	72.5	71.7	62.0	49.6	33.8	23.1	47.4
Middle Slope:													
Denver, Colo	30.3	29.5	39.6	47.2	55.4	66.9	72.3	70.5	62.0	50.1	36.3	31.7	49.4
Pike's Peak, Colo	1.8	8.4	7.2	13.0	21.8	33.6	39.7	38.1	30.7	20.5	10.0	6.7	18.9
West Las Animas, Colo	21.9	26.9	40.9	48.4	57.2	68.9	75.1	72.1	65.4	52.5	36.9	26.9	49.2
Dodge City, Kans	27.4	30.8	41.8	52.2	61.6	73.2	76.2	73.9	67.0	54.6	38.0	29.1	52.2
Elliott, Fort, Tex	31.7	35.5	45.7	55.5	63.1	73.2	76.0	74.0	67.9	57.4	41.0	33.8	54.6
Southern Slope:													
Sill, Fort, Ind. T	36.9	41.8	50.5	62.2	69.1	78.4	81.1	79.7	72.9	62.6	46.8	37.7	60.2
Concho, Fort, Tex	42.8	48.3	56.9	64.0	71.2	79.9	81.7	79.1	72.9	64.8	51.2	46.1	63.1
Davis, Fort, Tex	42.4	47.8	53.7	59.2	67.0	74.9	75.7	71.0	66.1	60.5	48.9	45.5	59.2
Stockton, Fort, Tex	43.1	48.5	56.1	62.5	70.5	79.1	80.2	76.8	71.0	63.2	50.4	46.3	62.2
Southern Plateau:													
Santa Fé, N. Mex	27.2	31.6	38.6	46.6	55.4	65.9	68.0	64.9	58.0	48.5	35.0	30.2	46.8
El Paso, Tex	43.4	48.9	55.4	63.0	71.5	80.8	81.8	78.0	71.2	62.1	49.5	45.8	62.5
Apache, Fort, Ariz	33.8	37.4	43.5	49.4	56.7	67.0	71.9	69.0	62.1	52.7	40.3	36.5	51.7
Grant, Fort, Ariz	42.1	44.3	50.0	57.0	65.8	76.1	77.3	73.4	70.0	60.7	49.7	45.1	59.3
Prescott, Ariz	34.5	36.0	42.5	49.1	57.0	66.4	71.4	69.1	62.1	51.7	40.9	37.6	51.5
Thomas, Camp, Ariz	40.1	46.8	53.2	59.5	68.4	78.9	83.2	80.1	72.7	59.5	48.0	43.3	61.4
Yuma, Ariz	52.8	56.3	62.5	68.3	76.3	84.5	91.4	90.1	82.9	69.9	59.7	55.4	70.8

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Middle Plateau:	°	°	°	°	°	°	°	°	°	°	°	°	°
Winnemucca, Nev	28.9	30.0	38.9	46.2	53.4	63.5	71.7	69.2	58.7	44.9	33.0	32.4	48.0
Salt Lake City, Utah	27.9	29.7	40.0	47.9	57.1	68.5	74.4	74.2	63.2	49.6	36.1	33.6	50.3
Northern Plateau:													
Boisé City, Idaho	28.5	30.6	41.5	49.0	57.2	66.0	72.1	71.1	58.6	47.0	36.6	31.8	49.4
Lewiston, Idaho	31.6	30.4	43.2	50.8	58.6	66.9	72.8	72.0	59.7	49.0	38.0	31.3	50.4
Dayton, Wash	30.9	29.1	42.4	48.9	55.9	63.9	67.4	66.7	58.2	48.1	37.4	30.5	48.2
Spokane Falls, Wash	23.7	24.2	38.6	47.4	55.7	63.8	67.9	67.3	55.7	47.1	35.9	27.6	46.2
North Pacific Coast:													
Canby, Fort, Wash	42.6	38.2	44.0	50.5	53.4	55.2	58.6	60.7	57.6	51.8	42.1	25.8	49.9
Olympia, Wash	37.8	36.9	43.3	48.0	53.1	58.4	61.1	61.5	56.6	48.9	43.2	39.3	48.9
Tatoosh Island, Wash	41.5	36.6	42.7	49.2	50.9	53.3	55.8	56.4	52.9	49.1	46.4	39.4	47.8
Portland, Oreg	39.3	38.0	46.0	51.1	56.6	61.7	64.8	64.2	58.9	52.9	44.4	40.1	51.4
Roseburg, Oreg	39.8	39.8	45.9	50.5	56.0	61.3	65.5	63.8	59.9	50.1	43.1	41.5	51.5
Middle Pacific Coast:													
Cape Mendocino, Cal	46.6	44.6	48.6	47.8	51.0	54.6	53.8	55.0	57.2	53.8	51.3	49.0	51.2
Red Bluff, Cal	45.3	47.0	53.7	57.9	66.8	74.9	82.3	79.3	72.2	60.2	53.7	46.6	61.6
Sacramento, Cal	45.3	47.7	53.4	56.8	63.4	67.9	71.9	70.7	68.1	59.1	51.1	46.1	58.5
San Francisco, Cal	49.3	49.7	52.5	53.9	57.0	57.9	58.8	58.1	59.2	57.4	54.2	51.2	55.0
South Pacific Coast:													
Los Angeles, Cal	53.0	53.1	54.7	57.6	61.3	65.6	68.2	69.6	67.5	61.8	57.4	54.5	60.4
San Diego, Cal	52.8	53.5	55.1	57.8	61.4	64.5	66.9	68.5	66.3	61.5	57.2	55.6	60.1
Alaska Stations:													
Saint Michael's, Fort, Alaska	5.3	1.6	10.8	19.0	33.2	46.2	53.7	52.5	43.5	31.3	19.0	4.4	26.7
Sitka, Alaska	37.0	32.7	37.0	42.7	46.6	51.2	53.8	55.8	51.9	45.1	42.2	35.2	43.9
Unalashka, Alaska	31.3	33.8	33.0	35.0	39.4	45.8	50.4	50.4	47.0	42.0	34.7	32.0	40.6
Behring's Island, Behring Sea	25.7	23.8	26.8	29.6	36.0	42.3	47.4	51.3	47.2	38.1	30.4	27.4	35.7

APPENDIX 11.

Mean monthly temperature, and departure (of 1884) *therefrom, in degrees Fahrenheit, at selected stations of the Signal Service, United States Army. (This normal has been computed for the decade ending December* 31, 1884.)

[The daily means are obtained by dividing the sum of the three observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month. Observations from January 1, 1875, to November 1, 1879, taken at 7.35 a. m., 4.35 and 11 p. m., Washington time, and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m., Washington time.]

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
New England:																								
Eastport, Me	19.0	−1.4	22.8	+ 1.9	28.5	−0.3	38.2	+1.7	47.2	−0.7	55.5	+1.9	60.4	−1.8	61.0	±0.0	55.8	+0.7	46.7	−1.3	36.0	+0.4	25.2	+ 1.1
Portland, Me	23.6	−1.2	27.5	+ 2.2	33.9	−0.2	44.4	+1.3	55.4	−1.5	64.6	+2.2	69.9	−2.4	68.6	−1.1	61.8	+2.7	50.9	−0.3	39.4	−0.3	31.2	− 0.5
Mount Washington, N. H	4.4	+0.8	6.9	+ 7.2	11.2	+1.0	21.1	+4.3	32.9	−0.9	44.4	+4.6	47.6	−3.0	47.6	+0.1	41.0	+0.4	30.2	−1.8	17.5	−0.7	10.2	+ 1.7
Boston, Mass	25.7	−1.9	28.5	+ 2.5	34.1	−0.6	43.7	−1.0	56.0	−2.2	65.9	+0.1	70.8	−2.8	69.1	−0.8	62.3	+3.5	51.7	+0.6	39.7	+1.4	30.4	+ 2.7
New Haven, Conn	27.5	−4.3	30.4	+ 1.3	35.8	−2.2	46.3	−1.4	58.3	−2.4	67.8	−1.0	72.7	−4.9	70.8	−1.7	64.5	+1.9	53.8	−0.6	41.4	−0.5	31.9	− 0.4
New London, Conn	28.5	−2.4	30.9	+ 2.7	36.2	−0.4	45.6	−0.2	56.5	−0.7	65.8	−0.7	71.0	−3.5	70.0	−1.5	64.1	+2.8	54.2	+0.4	42.3	+0.6	32.8	+ 1.7
Middle Atlantic States:																								
Albany, N. Y	22.7	+0.9	26.2	+ 6.8	33.0	+2.8	46.1	+1.7	59.5	−0.4	68.8	+3.7	72.6	−1.9	71.3	+1.3	63.4	+4.1	51.5	−0.2	39.2	−0.8	28.6	− 0.8
New York City	29.6	−3.4	32.1	+ 3.0	37.0	+0.5	47.0	−0.6	59.1	−0.3	68.3	+0.4	73.4	−3.3	72.0	−0.5	66.0	+3.6	55.7	+0.4	43.2	±0.0	33.6	+ 1.0
Philadelphia, Pa	31.2	−1.7	34.8	+ 5.5	39.8	+1.7	49.8	−1.1	62.1	−0.8	71.2	−0.7	75.8	−4.0	73.7	−1.2	67.8	+3.3	56.9	+0.8	44.4	−0.6	35.0	− 0.4
Atlantic City, N. J	31.6	−2.4	34.1	+ 3.5	38.5	+0.1	46.7	+0.3	57.4	+1.3	66.6	−0.2	72.4	−1.8	72.2	−0.7	67.2	+2.5	57.3	+1.2	44.3	+1.1	35.6	+ 1.9
Barnegat City, N. J	30.9	−2.0	33.2	+ 4.6	33.0	+1.0	46.1	+0.8	57.1	+1.6	66.2	±0.0	72.2	−1.7	71.8	−0.7	66.7	+2.6	56.6	+1.7	44.1	+2.3	35.2	+ 3.4
Cape May, N. J	34.1	−2.5	37.0	+ 2.5	41.1	−1.1	48.6	−0.4	59.3	+0.5	68.4	−0.8	74.1	−1.7	73.5	−0.8	68.8	+2.1	59.3	+0.5	47.7	+0.6	38.5	+ 1.5
Sandy Hook, N. J	30.5	−2.8	32.8	+ 3.0	37.7	+0.3	46.9	+0.3	59.2	−0.3	68.8	−0.4	74.4	−3.4	73.0	−1.3	67.2	+3.2	57.1	+0.1	44.7	−0.2	35.0	+ 1.1
Baltimore, Md	34.0	−2.0	37.7	+ 4.5	42.6	+1.4	52.8	−0.5	64.6	+0.2	73.6	−0.4	78.1	−3.0	75.0	+0.2	68.4	+3.7	58.5	+1.7	46.0	+0.4	37.4	± 0.0
Washington City	32.6	−3.2	36.9	+ 4.0	41.8	+0.4	52.1	−1.2	64.2	+0.2	73.0	−0.5	77.6	−3.4	74.4	−0.2	68.1	+3.6	57.7	+1.9	44.6	+0.1	35.7	+ 0.3
Cape Henry, Va	40.0	−3.7	43.2	+ 3.5	46.9	−0.1	54.1	−2.1	64.3	+0.9	73.1	−2.0	78.0	−3.0	76.4	−1.3	72.1	+1.7	63.2	+1.7	51.7	+1.5	43.4	+ 1.5
Lynchburg, Va	37.2	−4.0	41.8	+ 3.8	46.9	+0.8	56.2	−2.1	67.0	+0.4	74.8	−3.2	79.6	−3.0	76.2	−1.4	69.5	+2.7	59.8	+2.8	47.0	−1.1	39.6	+ 0.5
Norfolk, Va	40.3	−2.1	44.0	+ 6.1	48.4	+1.9	55.6	−1.1	66.5	+1.6	75.4	−2.0	79.8	−2.4	77.0	−1.0	71.4	+2.5	62.0	+2.6	50.6	+2.0	43.0	+ 2.2
South Atlantic States:																								
Wilmington, N. C	47.1	−2.8	50.4	+ 3.1	54.9	+3.2	60.8	−0.3	68.8	+2.7	75.8	−1.9	80.0	−0.3	78.0	−1.1	73.4	+1.8	64.8	+3.7	54.4	+3.0	48.5	+ 2.7
Charleston, S. C	51.0	−4.4	53.6	+ 5.1	58.3	+1.5	64.0	−0.7	72.6	+2.2	79.3	−3.7	83.2	−1.0	80.9	−2.0	76.4	+0.8	67.8	+3.4	57.7	+1.4	51.9	+ 1.8
Augusta, Ga	48.2	−4.8	51.9	+ 4.6	57.2	+2.4	63.7	−1.6	72.6	+1.4	78.5	−4.3	82.6	−1.7	79.8	−0.7	75.0	+1.4	65.9	+4.7	54.5	+0.3	48.5	+ 2.2
Savannah, Ga	52.7	−6.1	55.1	+ 3.2	60.3	+1.4	66.4	−1.1	73.8	+2.3	80.2	−4.6	83.7	−1.3	80.9	−2.2	76.2	+0.2	67.8	+2.8	58.4	+0.3	53.2	+ 1.2
Jacksonville, Fla	56.4	−4.7	58.8	+ 3.3	63.5	+2.8	69.0	−0.3	75.2	+1.3	80.6	−3.7	83.1	−0.2	81.1	−1.3	77.9	±0.0	70.9	+1.9	62.1	−0.4	56.6	+ 1.8
Florida Peninsula:																								
Key West, Fla	71.0	−2.7	71.8	+ 0.7	73.6	+1.0	76.5	−0.3	79.8	+1.1	83.2	−1.5	84.5	+0.5	84.3	−0.4	82.9	−0.7	79.4	−1.1	75.0	−0.1	70.6	+ 2.4
Eastern Gulf States:																								
Mobile, Ala	51.4	−7.9	54.8	+ 2.5	60.5	+1.7	67.1	−0.9	74.6	±0.0	80.9	−3.1	82.4	−2.8	80.2	−1.5	76.8	+1.5	68.8	+3.4	58.3	−2.8	52.8	+ 1.6

Mean monthly temperature, and departure (of 1884) therefrom, in degrees Fahrenheit, at selected stations of the Signal Service, &c.—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
Eastern Gulf States—Continued.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Montgomery, Ala	49.2	−8.7	52.9	+ 2.5	56.6	+1.9	65.0	−1.6	73.3	+1.3	79.5	−3.9	82.5	−1.5	79.9	−1.5	75.5	+3.5	66.9	+4.6	55.3	−1.3	49.6	+ 1.6
Vicksburg, Miss	48.3	−7.5	53.0	+ 3.6	56.6	+0.4	65.6	−1.9	73.2	−1.4	79.6	−2.4	82.1	+0.8	79.8	−0.6	74.7	+3.8	66.7	+2.6	55.2	−0.5	50.6	+ 0.3
New Orleans, La	55.2	−8.1	58.4	+ 2.8	63.4	+1.4	69.2	−1.0	75.4	+1.0	81.0	−1.6	83.1	+2.3	81.8	+0.5	78.0	+2.9	71.4	+3.0	61.2	−1.5	56.0	+ 2.7
Western Gulf States:																								
Shreveport, La	46.4	−7.5	51.7	+ 2.0	59.3	+0.2	66.3	−3.5	73.6	−2.0	80.6	−1.2	83.3	+2.9	81.4	−0.6	74.8	+5.4	66.7	+1.3	54.4	−1.3	49.0	— 2.8
Galveston, Tex	53.1	−6.4	57.4	+ 3.0	63.9	+0.9	69.6	−2.4	76.5	−0.6	82.5	−1.1	84.5	+0.7	83.3	+0.5	79.4	+4.1	72.4	+1.4	62.0	−0.1	56.6	+ 1.0
Indianola, Tex	52.7	−6.0	57.8	+ 2.4	64.9	+0.8	70.4	−2.9	76.4	−1.0	82.0	−1.8	83.9	−0.4	82.6	−0.7	79.2	+1.8	73.5	+0.5	62.1	+0.6	56.2	— 2.2
Ohio Valley and Tennessee:																								
Knoxville, Tenn	37.2	−7.4	42.6	+ 4.0	48.3	+0.8	57.0	−1.9	66.4	+0.4	72.9	−1.1	76.5	−1.7	74.2	−1.0	68.8	+3.6	59.6	+6.1	46.7	−0.4	39.5	+ 0.7
Memphis, Tenn	40.3	−7.3	45.7	+ 2.1	52.4	+0.1	61.6	−2.1	70.6	−1.0	77.4	−1.9	81.3	+0.5	78.3	−0.5	71.4	+5.5	63.0	+3.3	49.9	+1.3	43.0	— 1.7
Nashville, Tenn	39.1	−9.0	43.9	+ 2.1	49.9	−0.3	59.5	−3.2	69.3	−1.0	76.2	−3.1	80.0	−1.9	77.3	−1.9	70.4	+3.9	61.7	+3.5	48.4	−0.3	41.1	— 0.7
Louisville, Ky	35.0	−7.6	39.8	+ 2.8	45.3	+1.4	56.2	−1.5	66.7	−0.9	74.0	+0.2	78.7	−2.3	75.8	−1.0	68.7	+6.0	59.4	+3.9	46.2	+1.8	38.4	— 0.8
Indianapolis, Ind	29.5	−7.9	34.4	+ 0.3	40.3	+0.8	52.5	−2.3	63.8	−1.7	71.6	+1.4	76.4	−2.7	73.6	−1.3	66.0	+5.6	56.1	+2.2	41.8	−0.8	33.2	— 3.3
Cincinnati, Ohio	34.0	−7.3	38.7	+ 2.5	43.8	+1.4	54.5	−1.6	65.3	−1.2	73.4	+1.2	78.2	−1.6	75.0	+0.1	68.4	+5.2	56.6	+2.7	45.2	−0.9	37.3	— 1.2
Pittsburg, Pa	30.5	−5.6	33.9	+ 5.5	38.6	+1.6	50.1	−0.5	61.9	+0.5	70.4	+0.3	74.0	−2.4	71.9	−0.2	65.4	+5.0	55.2	+2.9	42.0	+0.7	34.0	+ 0.3
Lower Lakes:																								
Buffalo, N. Y	23.7	−5.7	25.0	+ 1.3	30.0	−0.7	40.8	−1.1	53.3	−1.2	64.2	+2.3	69.4	−4.5	69.2	−1.7	62.3	+3.3	51.2	+0.8	38.3	−0.4	29.4	+ 0.4
Oswego, N. Y	25.9	−4.0	27.5	+ 1.7	32.3	−0.8	42.9	−2.0	54.8	−1.5	64.6	+1.0	70.0	−5.5	69.6	−2.2	62.7	+1.7	51.7	−1.4	39.7	−2.8	30.4	— 2.9
Erie, Pa	27.1	−6.4	29.0	+ 1.1	33.6	−0.4	44.8	−2.0	57.6	−0.7	67.2	+1.0	71.9	−4.2	70.4	−1.7	63.8	+3.6	53.9	+1.7	41.0	−0.2	32.3	+ 1.3
Cleveland, Ohio	26.8	−6.5	28.7	+ 0.9	33.6	±0.0	44.7	−1.2	57.9	−0.2	67.0	+1.5	71.3	−2.3	69.7	−1.5	63.7	+3.6	53.7	+2.0	39.6	−0.8	30.4	— 0.4
Toledo, Ohio	27.4	−7.4	30.9	− 1.0	36.0	−0.8	47.9	−2.2	60.3	−0.5	69.3	+1.4	73.9	−2.3	71.5	−1.5	64.4	+4.9	54.2	+2.1	40.8	−0.8	31.8	— 1.8
Detroit, Mich	24.5	−3.2	28.2	+ 2.4	33.3	+2.3	45.6	−0.1	58.1	+0.8	67.2	+3.2	71.8	−2.0	70.2	−0.8	63.1	+5.3	52.7	+3.6	39.1	+0.5	30.0	+ 0.5
Upper Lakes:																								
Alpena, Mich	18.2	−5.5	18.9	− 3.7	24.1	−0.9	36.9	+0.4	49.0	−0.5	59.4	+2.1	65.7	−4.4	64.6	−2.6	57.3	+3.2	45.9	+2.4	32.7	−1.0	23.9	— 0.7
Escanaba, Mich	14.6	−6.0	16.5	− 6.5	23.0	−1.9	36.2	+0.1	49.8	−0.7	60.2	+2.4	66.6	−4.0	65.0	−3.3	56.8	+3.3	45.2	+2.3	31.7	−1.4	21.9	— 2.2
Grand Haven, Mich	25.6	−4.7	27.1	− 2.3	32.2	−0.2	44.2	−0.5	55.8	−0.7	64.0	+4.0	69.4	−2.5	68.1	−2.4	61.3	+4.1	51.3	+2.8	38.4	−0.1	30.3	— 1.9
Marquette, Mich	17.3	−6.4	18.7	− 3.6	25.0	−2.3	37.8	−2.2	49.8	−2.6	58.5	+1.2	65.6	−5.7	65.0	−2.0	56.8	+3.0	46.1	+1.5	32.2	−0.9	23.6	— 3.2
Port Huron, Mich	21.6	−6.0	24.2	− 0.7	29.4	−0.5	40.8	−1.6	53.3	±0.0	63.0	+2.4	68.3	−3.6	67.9	−2.1	60.8	+4.1	49.9	+1.1	35.8	−1.1	26.8	— 0.9
Chicago, Ill	24.9	−5.7	29.4	− 1.7	35.2	−1.0	45.9	−1.6	57.0	−0.3	65.2	−0.2	72.0	−2.3	71.5	−2.7	64.2	+4.7	53.4	+3.0	39.5	+0.1	29.8	— 1.4
Milwaukee, Wis	20.0	−6.4	24.9	− 2.8	30.8	−1.3	42.5	−1.6	53.6	−0.1	62.0	−1.7	68.8	−3.0	68.5	−2.7	60.8	+3.2	50.1	+3.2	35.6	−0.6	25.5	— 2.8
Duluth, Minn	11.2	−5.9	16.4	− 3.8	25.0	−2.9	38.8	−2.8	48.8	+0.1	57.9	−0.2	66.5	−4.1	65.8	−2.1	56.3	+1.2	45.0	+1.7	29.4	−0.8	17.8	— 7.0
Upper Mississippi Valley:																								
Saint Paul, Minn	13.9	−6.0	19.4	− 6.1	28.9	−0.7	45.4	+1.0	58.5	+0.5	66.4	+3.3	71.6	−2.4	69.8	−0.9	59.5	+4.1	47.6	+4.2	31.1	+0.8	19.2	— 4.4
La Crosse, Wis	16.8	−5.4	23.5	− 5.6	31.9	−2.4	47.7	−1.2	60.5	−0.1	68.1	+2.3	72.9	−3.0	71.0	−2.4	61.9	+4.9	50.7	+3.4	34.5	−0.5	23.3	— 6.1
Davenport, Iowa	21.9	−3.1	28.3	− 1.4	35.6	+0.8	49.3	+0.3	61.6	−0.4	69.3	+1.0	74.7	−2.9	72.6	−2.6	64.4	+5.1	53.5	+3.7	38.2	+2.1	28.1	— 3.0
Dubuque, Iowa	19.0	−4.9	25.2	− 3.0	33.4	−1.2	48.5	−0.1	60.6	−0.6	68.2	+0.4	73.6	−3.6	71.6	−3.2	62.9	+5.0	52.0	+3.1	35.7	+0.6	25.2	— 3.9
Keokuk, Iowa	25.1	−6.4	31.2	− 3.7	38.2	−0.9	53.1	−1.5	63.2	−0.9	71.4	+0.1	77.1	−2.2	74.6	−2.6	66.6	+4.5	55.1	+3.4	39.4	+1.2	29.2	— 6.2

Cairo, Ill	36.0	−3.1	41.6	+ 0.4	47.9	−0.3	58.8	−2.6	67.9	−1.5	75.2	−1.5	79.5	−1.3	77.2	−1.8	69.6	+4.6	60.8	+2.5	47.0	+1.5	39.0	− 2.8
Saint Louis, Mo	31.9	−6.1	36.4	− 0.9	42.9	+0.7	56.4	−2.0	66.4	−0.9	73.3	−0.5	78.4	−1.1	76.1	−1.7	68.8	+5.1	58.4	+4.4	43.5	+3.6	34.8	− 2.0
Missouri Valley:																								
Leavenworth, Kans	26.7	−5.6	33.2	− 5.8	41.4	−0.1	54.0	−3.2	64.6	−2.6	72.9	−0.8	77.5	−0.2	75.7	−3.9	67.2	+4.5	56.2	+3.2	40.6	+2.5	31.4	− 7.3
Omaha, Nebr	21.1	−4.1	27.1	− 7.7	35.6	−0.3	50.3	−2.8	62.4	- 0.8	70.8	+1.5	76.0	−1.5	73.9	−3.6	64.4	+4.2	53.3	+4.1	36.7	+2.6	25.6	− 8.3
Yankton, Dak	15.1	−1.6	20.4	− 8.3	29.7	+0.2	45.7	−2.2	59.6	±0.0	68.0	+3.7	72.8	−1.8	71.7	−2.7	61.2	+3.1	49.4	+4.5	31.9	+2.6	20.2	− 8.4
Extreme Northwest:																								
Bismarck, Dak	5.8	−1.6	11.4	−11.5	21.7	−2.0	39.9	−1.2	54.9	+0.5	63.8	+5.6	69.2	−4.9	67.8	−2.1	55.8	+0.1	43.1	+3.4	25.8	+3.2	13.1	− 8.1
Northern Slope:																								
Cheyenne, Wyo	23.9	−0.3	28.0	− 4.3	33.0	−3.2	40.1	−3.9	50.2	−0.6	60.5	+0.6	66.8	−1.2	64.7	−3.6	55.6	+0.9	44.2	+3.4	32.8	+3.4	27.4	− 3.6
North Platte, Nebr	20.5	−1.1	26.4	− 6.7	35.6	−1.6	47.0	−2.5	58.4	−0.5	68.3	+2.5	73.5	+0.1	72.0	−3.6	61.7	+3.2	49.4	+5.2	34.2	+3.4	24.7	− 8.2
Middle Slope:																								
Denver, Colo	27.2	+4.3	32.6	− 2.7	40.0	−1.0	47.1	−3.6	56.4	−2.1	66.5	+0.5	72.4	+1.8	70.2	−2.2	61.5	+3.1	50.5	+5.0	37.1	+5.0	31.2	− 6.6
Pike's Peak, Colo	2.4	±0.0	4.0	− 1.4	7.8	−2.9	18.0	−4.5	21.8	−1.4	32.5	−2.1	39.8	±0.0	38.5	−2.9	32.4	−0.4	21.3	+3.1	10.1	+3.2	6.1	− 0.7
Dodge City, Kans	26.6	−1.0	33.3	− 4.8	42.1	−0.3	52.8	−3.7	63.0	−3.5	72.9	−1.7	77.3	−0.7	75.0	−3.1	67.2	+3.1	54.8	+2.8	38.8	+2.8	30.2	− 9.2
Middle Plateau:																								
Salt Lake City, Utah	28.7	+0.4	32.9	− 1.6	41.7	−1.1	48.8	−0.8	56.9	+0.8	67.8	+0.9	75.1	−1.7	74.7	−2.1	64.8	−5.5	51.4	+1.2	38.3	+3.8	32.7	+ 2.8
North Pacific Coast:																								
Portland, Oreg	38.8	−0.1	41.2	−5.2	47.0	−1.6	51.8	+2.2	56.0	+3.8	62.1	+0.6	65.9	−2.4	65.2	+2.8	60.5	−4.8	52.8	−1.6	45.2	+1.5	41.2	−10.2
Middle Pacific Coast:																								
San Francisco, Cal	50.2	−0.2	51.7	− 1.7	53.7	+0.3	54.5	+0.5	56.6	+1.6	58.7	+0.3	58.6	+1.4	58.4	+0.3	59.7	−1.4	58.8	−1.9	55.4	+1.1	51.7	+ 0.8
South Pacific Coast:																								
San Diego, Cal	53.5	+1.5	54.7	+ 1.2	55.9	+0.6	58.0	−0.4	61.2	+0.2	64.7	−0.3	67.2	+1.2	68.8	+0.7	66.7	−1.6	62.8	−1.5	58.1	+0.5	55.7	− 1.3
Alaska Stations:																								
Saint Michael's, Fort, Alaska	7.8	−4.7	−0.9	+12.8	9.1	+4.6	19.2	+3.8	32.9	+1.7	46.6	+0.8	53.7	−1.2	52.0	+3.7	43.9	−3.5	30.8	−7.9	16.8	±0.0	5.1	+8.1

APPENDIX 12.

Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army.

[The daily means are obtained by dividing the sum of the three telegraphic observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month; the annual, by dividing the sum of the monthly by 12. From August 26, 1872, to November 1, 1879, observations were taken at 7.35 a. m., 4.35 and 11 p. m., Washington time; and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m., Washington time.]

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°		°
Eastport, Me	.....	41.1	38.6	40.8	42.6	43.0	40.6	42.3	42.1	41.5	40.6	41.5	11	41.3
Portland, Me	43.7	44.9	44.1	48.0	48.3	49.1	47.1	48.7	48.4	48.0	46.4	47.6	12	47.0
Mt. Washington, N. H	25.4	25.8	23.5	25.9	27.8	28.0	25.8	27.6	27.6	25.6	24.3	27.4	12	26.2
Boston, Mass	48.3	48.7	46.2	47.8	49.2	49.2	47.8	49.4	48.5	48.1	47.6	48.3	12	48.2
Block Island, R. I	.....		.....	.....	.....	.....	.. .	.	50.3	50.0	48.8	49.5	4	49.6
New Haven, Conn	47.8	49.2	48.2	50.7	52.4	52.9	50.7	51.6	49.8	48.7	47.5	48.8	12	49.9
New London, Conn	47.4	49.1	47.3	49.5	51.0	51.3	49.7	50.8	50.3	49.8	48.8	49.7	12	49.6
Middle Atlantic States:														
Albany, N. Y	.....	46.3	43.6	47.0	48.1	48.7	46.4	50.4	51.4	51.0	49.2	50.0	11	48.4
New York City	50.2	51.4	48.6	50.5	52.6	52.9	51.3	52.2	52.2	51.5	50.6	51.6	12	51.3
Philadelphia, Pa	51.5	52.6	50.1	52.5	53.9	54.6	53.4	54.5	54.2	54.6	53.6	53.5	12	53.2
Atlantic City, N. J	.....	51.6	49.2	51.1	52.5	53.0	51.5	53.3	52.7	52.6	51.4	52.6	11	52.0
Barnegat City, N. J	.....	51.0	48.8	51.0	52.1	52.4	50.7	52.4	51.6	52.0	51.6	52.6	11	51.5
Cape May, N. J	51.7	52.2	50.2	53.6	54.8	56.0	54.2	55.6	54.7	55.2	53.8	54.3	12	53.9
Sandy Hook, N. J	.....	49.8	49.1	51.9	53.3	53.4	51.6	53.5	53.3	52.7	51.6	52.2	11	52.0
Del. Breakwater, Del	.....	.....	.....	.....	.....	.....	.....	.....	54.4	54.0	53.8	54.1	4	54.0
Baltimore, Md	54.3	55.5	53.1	54.9	56.3	56.9	55.6	56.4	57.1	55.7	55.1	56.2	12	55.6
Washington City	54.8	55.9	52.2	54.4	55.5	56.0	55.1	55.6	55.9	54.9	54.0	55.1	12	55.0
Cape Henry, Va	....	59.1	57.6	58.4	58.3	59.6	58.8	60.6	59.5	58.9	58.3	58.7	11	58.9
Chincoteague, Va	.....	.....	.....	.....	.....	.....	.. .	...	54.7	55.2	54.6	55.6	4	55.0
Lynchburg, Va	55.0	56.6	55.3	57.1	59.2	58.7	58.4	58.2	59.8	57.7	57.5	57.6	12	57.6
Norfolk, Va	58.1	58.7	57.6	59.0	58.9	59.8	59.2	60.5	59.9	59.8	59.9	60.4	12	59.3
South Atlantic States:														
Charlotte, N. C	.....	.....	.....	.....	.....	.....	60.4	60.8	61.4	60.4	60.5	60.5	6	60.6
Hatteras, N. C	.....	.....	.....	.....	.....	.....	.....	. . .	61.9	61.7	61.2	62.2	4	61.8
Kitty Hawk, N. C	.....	.....	.....	59.8	59.8	60.1	59.3	61.3	59.7	59.5	59.5	60.4	9	59.8
Macon, Fort, N. C	.....	.....	.....	.....	.....	.....	.....	.....	62.4	62.4	61.9	62.7	4	62.4
Smithville, N. C	.....	.....	.....	63.1	63.2	63.7	63.1	65.0	63.4	63.2	63.1	63.8	9	63.5
Wilmington, N. C	63.0	63.6	61.5	61.6	62.4	62.2	62.6	63.6	64.2	64.2	64.0	64.5	12	63.1
Charleston, S. C	64.6	65.7	64.8	65.5	66.1	66.5	66.7	67.2	66.8	67.1	66.6	66.7	12	66.2
Augusta, Ga	62.9	64.4	63.3	63.4	64.3	65.2	65.2	65.4	65.7	65.3	65.8	65.2	12	64.7
Savannah, Ga	65.0	66.5	65.8	66.6	67.0	67.8	67.4	68.0	67.8	68.1	68.3	67.1	12	67.1
Jacksonville, Fla	68.2	69.8	68.8	68.4	69.1	69.3	69.3	70.2	70.2	70.4	70.6	69.6	12	69.5
Florida Peninsula:														
Cedar Keys, Fla	.....	.....	.....	.....	.....	.....	.. .	70.9	70.5	71.1	72.4	70.7	5	71.1
Key West, Fla	77.0	77.8	78.1	77.0	77.0	77.1	77.1	78.7	78.1	78.2	78.4	77.6	12	77.7
Eastern Gulf States:														
Atlanta, Ga	.....	.....	.....	.....	.....	.....	61.5	62.1	62.0	61.8	61.5	61.1	6	61.7
Pensacola, Fla	.....	.....	.....	.	.....	.....	.....	68.3	68.3	68.4	69.0	67.8	5	68.4
Mobile, Ala	66.0	67.9	66.7	66.0	66.8	67.3	67.0	(1)	68.0	68.2	68.9	66.7	11	67.2
Montgomery, Ala	64.2	66.1	65.2	64.6	65.3	65.8	65.6	65.8	66.1	66.0	66.7	65.4	12	65.6
Vicksburg, Miss	65.8	66.0	64.0	64.3	64.9	66.0	66.3	65.2	66.8	66.9	66.4	65.5	12	65.7
New Orleans, La	68.0	69.9	68.8	68.4	68.3	68.9	69.8	69.4	69.7	70.8	71.1	69.8	12	69.4
Western Gulf States:														
Shreveport, La	64.5	68.0	65.2	64.7	64.8	65.6	66.9	65.6	66.4	66.2	65.8	65.1	12	65.7
Fort Smith, Ark	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59.7	59.3	2	59.5
Little Rock, Ark	....	.....	.....	.....	.....	.....	....	61.9	63.0	62.9	62.1	61.4	5	62.3
Galveston, Tex	69.3	70.5	69.8	70.1	69.0	70.0	70.8	69.8	70.1	71.5	70.6	70.3	12	70.2
Indianola, Tex	69.6	70.6	69.4	69.7	69.4	70.7	71.1	69.5	70.1	71.8	70.3	69.4	12	70.1
Palestine, Tex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.7	64.4	2	65.0
Rio Grande Valley:														
Brownsville, Tex	.....	.....	.....	.....	.....	72.7	73.7	72.6	72.5	73.8	72.7	71.6	7	72.8
Rio Grande City, Tex	.....	.....	.....	.....	.....	.....	74.2	72.8	73.1	(1)	(1)	73.5	4	73.4
Ohio Valley and Tennessee:														
Chattanooga, Tenn	.....	.....	.....	.....	.....	.....	60.7	60.3	60.8	60.4	60.8	59.6	6	60.4

[1] Record incomplete.

[2] No record.

Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
Ohio Valley and Tennessee—Continued:	°	°	°	°	°	°	°	°	°	°	°	°		°
Knoxville, Tenn	56.5	57.8	55.5	55.7	57.0	57.6	58.8	58.5	58.7	58.2	57.9	57.5	12	57.5
Memphis, Tenn	59.6	62.4	59.4	60.1	60.9	61.9	61.6	61.0	62.5	62.5	61.4	61.1	12	61.2
Nashville, Tenn	59.1	61.5	58.4	58.9	59.5	60.0	60.5	60.2	61.2	60.8	59.1	58.7	12	59.8
Louisville, Ky	55.7	57.8	54.5	56.2	57.5	57.8	57.2	57.4	58.2	57.9	56.4	57.1	12	57.0
Indianapolis, Ind	51.9	54.6	50.2	52.9	54.3	55.0	53.8	53.9	54.7	53.5	51.8	52.5	12	53.3
Cincinnati, Ohio	55.0	57.0	53.0	55.2	56.2	57.0	56.2	56.8	57.7	56.9	55.3	56.0	12	56.0
Columbus, Ohio	.....	.....	.....	.....	.....	.....	52.8	53.5	53.7	52.7	51.1	52.2	6	52.7
Pittsburg, Pa	50.4	51.7	48.8	51.5	52.8	52.8	52.1	53.4	54.0	52.8	51.9	53.2	12	52.1
Lower Lakes:														
Buffalo, N. Y	46.0	46.2	42.7	45.8	47.8	48.8	46.4	47.5	47.8	47.0	44.9	45.8	12	46.4
Oswego, N. Y	46.3	46.9	44.2	47.2	49.0	51.2	48.3	49.1	48.2	47.9	45.5	46.1	12	47.5
Rochester, N. Y	45.1	46.7	43.9	46.8	48.6	49.6	47.4	48.7	48.6	46.7	(1)	46.0	11	47.1
Erie, Pa	.....	50.1	46.4	49.0	50.3	51.8	49.7	50.4	50.0	49.5	47.5	48.8	11	49.4
Cleveland, Ohio	48.6	50.5	45.9	48.0	50.0	50.5	49.1	50.0	49.8	49.4	47.3	48.4	12	49.0
Sandusky, Ohio	.....	.....	.....	.....	.....	52.0	50.8	51.4	51.3	50.7	(1)	49.9	6	51.0
Toledo, Ohio	49.3	49.8	46.7	50.2	52.1	52.8	51.2	51.9	51.8	51.5	48.9	49.9	12	50.5
Detroit, Mich	46.2	48.3	44.1	47.2	49.0	49.6	48.0	48.7	51.2	51.2	47.7	49.7	12	48.4
Upper Lakes:														
Alpena, Mich	39.7	41.2	37.2	40.9	43.8	45.0	41.3	42.2	42.1	42.7	38.7	40.4	12	41.2
Escanaba, Mich	39.2	40.4	36.1	39.8	42.5	44.6	40.9	41.8	41.1	42.8	37.9	39.2	12	40.5
Grand Haven, Mich	45.2	47.5	43.3	46.9	48.9	50.1	47.8	48.3	48.1	48.2	44.7	46.9	12	47.2
Mackinaw City, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39.3	40.7	2	40.0
Marquette, Mich	39.2	41.2	37.0	40.8	44.4	46.5	42.5	42.0	41.0	42.3	38.1	39.0	12	41.2
Port Huron, Mich	.....	.....	41.7	44.9	46.8	47.9	45.3	46.9	45.8	45.7	42.7	44.4	10	45.2
Chicago, Ill	47.2	50.4	45.4	49.0	50.3	51.4	49.9	50.6	49.4	49.6	46.3	48.2	12	49.0
Milwaukee, Wis	43.9	45.0	40.8	43.9	45.8	48.5	46.2	46.7	46.8	47.1	43.4	43.9	12	45.1
Duluth, Minn	39.3	39.8	36.3	37.9	43.5	45.3	40.0	38.7	40.4	41.2	38.0	37.3	12	39.8
Upper Mississippi Valley:														
Saint Paul, Minn	41.6	43.3	39.8	42.3	47.5	48.2	45.5	44.0	45.2	45.6	40.9	43.7	12	44.0
La Crosse, Wis	43.5	47.5	43.1	45.5	48.8	50.9	47.6	46.9	48.0	48.7	43.9	45.5	12	46.7
Davenport, Iowa	49.0	49.6	45.4	48.8	50.8	52.2	50.0	51.0	50.4	51.7	48.3	49.8	12	49.8
Des Moines, Iowa	.....	.....	.....	.....	.....	.....	49.8	49.9	49.2	49.7	46.1	47.5	6	48.7
Dubuque, Iowa	.....	48.9	44.8	47.6	49.6	50.6	48.6	48.6	48.6	49.0	45.5	47.1	11	48.1
Keokuk, Iowa	50.5	52.6	48.5	51.0	52.9	55.0	52.9	53.5	52.6	52.6	49.6	50.7	12	51.9
Cairo, Ill	56.8	58.4	55.7	57.1	58.5	60.1	59.6	59.0	59.6	59.2	57.4	57.4	12	58.2
Springfield, Ill	.....	.....	.....	.....	.....	.....	.....	54.1	53.8	53.9	51.0	52.3	5	53.0
Saint Louis, Mo	53.7	56.3	53.9	55.4	56.4	57.4	55.7	55.1	55.9	55.6	53.6	55.3	12	55.4
Missouri Valley:														
Leavenworth, Kans	51.7	54.2	51.0	53.2	53.8	55.4	54.5	54.1	54.1	54.7	51.7	51.9	12	53.4
Omaha, Nebr	48.6	50.0	46.3	48.6	50.9	52.5	51.5	50.3	49.7	51.4	47.8	48.4	12	49.7
Bennett, Fort, Dak	.....	.....	.....	.....	.....	.....	.....	.....	43.8	45.7	42.2	42.5	4	43.6
Huron, Dak	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.8	40.7	40.8	3	41.8
Yankton, Dak	.....	46.7	41.2	43.5	46.7	48.2	47.3	46.5	45.4	47.4	44.0	44.6	11	45.6
Extreme Northwest:														
Moorhead, Minn	.....	.....	.....	.....	.....	.....	.....	.....	37.9	38.6	34.0	35.9	4	36.6
Saint Vincent, Minn	.....	.....	.....	.....	.....	.....	.....	.....	35.5	34.4	30.3	32.5	4	33.2
Bismarck, Dak	.....	.....	35.0	36.8	42.4	44.8	39.5	38.4	40.1	41.1	37.7	37.8	10	39.4
Buford, Fort, Dak	.....	.....	.....	.....	.....	.....	39.0	36.6	39.4	41.0	36.2	37.4	6	38.3
Northern Slope:														
Assinaboine, Ft., Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	42.7	39.2	39.1	3	40.3
Benton, Fort, Mont	42.5	43.3	42.1	(1)	(2)	(2)	(2)	40.8	43.6	44.8	43.0	41.5	8	42.6
Custer, Fort, Mont	.....	.....	.....	.....	.....	.....	.....	43.0	45.3	45.2	(1)	40.9	4	43.6
Helena, Mont	.....	.....	.....	.....	.....	.....	.....	.....	43.8	43.8	42.7	40.2	4	42.6
Maginnis, Fort, Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39.5	38.1	2	38.8
Shaw, Fort, Mont	.....	.....	.....	.....	.....	.....	.....	.....	42.1	42.5	40.6	39.8	4	41.2
Deadwood, Dak	.....	.....	.....	.....	.....	.....	.....	40.8	(1)	42.9	40.5	40.5	4	41.2
Cheyenne, Wyo	44.8	45.5	42.5	44.8	44.2	44.2	46.5	42.9	45.8	43.9	42.4	42.6	12	44.1
North Platte, Nebr	.....	.....	46.3	47.5	48.2	49.7	48.1	47.1	47.9	49.1	45.9	46.8	10	47.7
Middle Slope:														
Denver, Colo	48.1	49.8	48.6	49.5	48.8	49.5	50.8	47.4	50.8	50.3	48.8	49.5	12	49.3
Pike's Peak, Colo	.....	18.9	18.2	19.0	18.4	19.4	21.9	17.9	20.7	18.8	18.7	18.3	11	19.1
West Las Animas, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.6	48.7	2	49.2
Dodge City, Kans	.....	.....	52.4	53.2	53.2	54.4	54.8	52.0	53.0	53.6	51.0	51.2	10	52.8
Elliott, Fort, Tex	.....	.....	.....	.....	.....	.....	.....	54.4	54.9	54.8	54.8	54.5	5	54.6
Southern Slope:														
Sill, Fort, Ind. T	.....	.....	.....	.....	59.5	61.6	62.0	59.4	61.2	60.0	(1)	(1)	6	60.6
Concho, Fort, Tex	.....	.....	.....	.....	.....	63.7	66.3	62.3	63.9	63.5	63.8	62.5	7	63.6
Davis, Fort, Tex	.....	.....	.....	.....	.....	.....	62.0	58.0	(1)	59.3	59.9	59.6	5	59.8
Stockton, Fort, Tex	.....	.....	.....	.....	.....	62.9	65.7	61.3	62.7	61.5	62.3	63.1	7	62.8
Southern Plateau:														
Santa Fé, N. Mex	48.6	48.0	48.0	47.5	47.6	47.5	50.2	45.4	(1)	48.3	(1)	(1)	9	47.9
El Paso, Tex	.....	.....	.....	.....	.....	.....	66.8	63.0	62.9	61.6	62.6	62.5	6	63.2
Apache, Fort, Ariz	.....	.....	.....	.....	.....	.....	53.4	50.8	52.4	51.3	52.2	51.9	6	52.0

[1] Record incomplete.

[2] No record.

Annual and mean-annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
Southern Plateau—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°		°
Grant, Fort, Ariz	.....	.....	.....	.....	.....	.....	63.2	59.1	59.8	58.6	59.0	60.0	6	60.0
Prescott, Ariz	.....	.....	.....	.....	.....	52.8	54.7	50.6	52.5	51.1	52.5	50.8	7	52.1
Thomas, Camp, Ariz	.....	.....	.....	.....	.....	.....	.....	.....	60.7	61.3	61.9	61.6	4	61.4
Yuma, Ariz	.....	.....	.....	74.0	73.7	72.0	73.3	70.2	71.9	70.8	(1)	70.4	8	72.0
Middle Plateau:														
Winnemucca, Nev	.....	.....	.....	.....	.....	49.8	50.0	(1)	49.2	46.8	(1)	(1)	4	49.0
Salt Lake City, Utah	.....	.....	52.4	51.2	51.4	51.9	53.0	48.6	51.8	49.2	50.8	50.9	10	51.1
Northern Plateau:														
Boisé City, Idaho	.....	.....	.....	.....	.....	52.4	51.4	48.9	50.0	48.6	(1)	50.0	6	50.2
Lewiston, Idaho	.....	.....	.....	.....	.....	.....	.....	49.5	51.1	51.6	50.3	49.4	5	50.4
Dayton, Wash	.....	.....	.....	.....	.....	.....	.....	47.9	49.3	48.6	48.1	47.2	5	48.2
Spokane Falls, Wash	.....	.....	.....	.....	.....	.....	.....	.....	.....	46.5	46.8	45.4	3	46.2
North Pacific Coast:														
Olympia, Wash	.....	.....	.....	.....	.....	50.8	49.0	47.7	49.7	48.9	49.0	49.4	7	49.2
Portland, Oreg	52.6	53.6	53.3	53.1	53.9	53.3	52.4	50.4	52.2	51.5	51.7	51.1	12	52.4
Roseburg, Oreg	.....	.....	.....	.....	.....	53.1	52.2	50.6	52.2	51.5	51.8	(1)	6	51.9
Middle Pacific Coast:														
Cape Mendocino, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.6	51.8	2	51.2
Red Bluff, Cal	.....	.....	.....	.....	.....	64.0	64.2	61.8	62.1	(1)	61.5	60.8	6	62.4
Sacramento, Cal	.....	.....	.....	.....	.....	61.3	60.3	57.2	59.2	58.5	58.8	58.8	7	59.2
San Francisco, Cal	55.9	55.7	55.6	56.3	57.3	56.5	56.1	54.2	55.8	54.4	54.7	55.6	12	55.7
South Pacific Coast:														
Los Angeles, Cal	.....	.....	.....	.....	.....	60.7	60.6	58.4	61.1	60.1	61.6	60.8	7	60.5
San Diego, Cal	60.6	59.6	61.6	61.0	62.1	60.6	60.1	58.5	60.4	59.8	61.2	60.7	12	60.5
Alaska Stations:														
Saint Michael's, Fort, Alaska	.....	.....	26.2	24.3	25.2	25.6	26.4	23.2	28.3	26.1	28.2	27.8	10	26.1
Sitka, Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.2	44.3	44.2	3	43.9
Behring's Island, Behring Sea	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35.5	35.9	2	35.7

[1] Record incomplete.

[2] No record.

APPENDIX 13.

Mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month of the year 1884. The daily range is the difference between the highest and lowest temperature, as recorded by self-registering thermometers.

[The mean daily is obtained by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New England:	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me	14.9	14.8	12.8	10.4	14.0	17.9	14.1	15.1	18.9	12.5	13.0	14.0
Portland, Me	16.1	15.4	15.5	14.2	15.8	18.8	15.9	14.5	16.5	15.3	14.0	13.8
Mount Washington, N. H	19.6	21.4	17.4	12.5	12.5	18.8	10.8	12.4	12.0	15.2	16.0	16.9
Boston, Mass	15.7	16.0	[1]16.0	14.1	18.7	21.8	17.8	15.8	19.5	17.7	17.5	15.1
Block Island, R. I	13.9	14.6	12.4	10.9	12.9	18.8	10.9	9.4	11.8	12.2	14.4	12.7
New Haven, Conn	16.8	16.5	15.7	16.9	18.6	22.8	16.0	16.4	20.2	18.7	18.5	16.0
New London, Conn	13.8	14.8	14.0	15.8	18.5	19.2	13.8	13.5	16.2	15.9	16.8	13.6
Middle Atlantic States:												
Albany, N. Y	16.8	13.8	11.5	13.9	16.1	20.0	15.6	16.9	16.5	17.8	14.9	14.7
New York City	13.2	14.5	13.8	16.0	16.7	18.8	15.6	14.6	17.8	16.6	15.2	13.2
Philadelphia, Pa	13.4	14.7	12.9	16.5	17.9	21.5	17.0	16.2	19.2	18.7	17.0	13.0
Atlantic City, N. J	14.1	11.9	12.6	14.2	15.2	12.6	14.1	11.4	12.7	15.0	17.3	12.9
Barnegat City, N. J	14.0	[2]12.5	(3)	13.1	14.9	13.9	14.5	11.5	13.9	15.9	17.2	14.8
Cape May, N. J	13.6	12.7	11.5	12.8	13.2	13.7	11.8	10.8	11.5	13.8	15.0	12.9
Sandy Hook, N. J	12.4	12.7	11.8	12.8	14.8	14.3	12.6	11.8	16.1	15.5	14.0	13.7
Delaware Breakwater, Del	12.4	13.9	12.4	10.9	13.0	12.0	11.9	9.3	13.4	13.2	13.4	11.4
Baltimore, Md	13.9	13.8	12.8	14.7	15.9	17.4	15.8	14.5	17.9	16.9	16.0	12.5
Washington City	14.6	16.3	14.9	18.1	20.6	21.4	18.7	18.8	21.7	20.0	19.8	13.6
Cape Henry, Va	16.1	16.7	15.8	14.5	15.4	14.6	13.8	12.6	14.6	14.5	15.4	14.8
Chincoteague, Va	14.0	13.9	13.6	13.9	16.5	16.8	14.0	11.6	15.2	16.0	16.0	13.9
Lynchburg, Va	15.7	17.8	17.8	17.8	19.6	18.8	19.1	19.0	21.8	21.4	20.7	15.5
Norfolk, Va	16.4	18.0	16.0	14.9	18.1	17.2	15.0	12.1	15.8	16.5	15.8	14.3
South Atlantic States:												
Charlotte, N. C	16.3	18.1	17.4	19.0	18.6	15.9	18.2	18.1	17.5	19.8	19.2	16.6
Hatteras, N. C	15.6	15.2	13.6	11.8	11.8	10.7	9.6	8.1	10.4	10.7	11.5	13.2
Kitty Hawk, N. C	14.5	17.5	15.8	12.4	16.2	13.1	13.9	9.7	11.8	13.9	12.6	14.0
Macon, Fort, N. C	14.8	14.1	12.3	13.0	10.6	10.8	9.1	8.6	9.8	11.7	13.8	14.3
Smithville, N. C	16.7	14.2	13.0	15.0	13.3	13.9	11.6	11.7	12.8	15.1	18.1	16.0
Wilmington, N. C	17.9	18.4	16.6	17.5	16.3	15.9	14.1	14.0	16.4	18.1	19.5	18.2
Charleston, S. C	16.2	15.0	14.0	14.6	13.2	11.9	13.0	12.6	11.6	12.6	15.4	14.0
Augusta, Ga	17.7	21.5	18.8	19.3	19.0	15.1	17.0	17.4	17.1	20.4	23.8	18.5
Savannah, Ga	16.9	16.9	15.1	16.0	15.8	13.0	13.8	[4]13.8	12.6	14.9	17.7	17.0
Jacksonville, Fla	18.0	17.3	16.5	16.5	15.9	14.3	14.7	15.7	14.1	15.1	16.4	14.5
Florida Peninsula:												
Cedar Keys, Fla	15.2	12.5	12.2	12.3	12.8	13.4	11.0	13.8	13.4	14.9	14.9	11.5
Key West, Fla	9.2	9.2	10.6	10.4	12.2	12.0	11.0	12.7	10.3	7.2	6.0	7.7
Sanford, Fla	19.9	18.6	18.9	20.2	21.0	18.4	18.7	17.8	17.2	18.8	20.1	20.2
Eastern Gulf States:												
Atlanta, Ga	18.1	17.2	15.8	16.3	16.8	14.2	14.2	15.6	17.6	18.1	18.6	15.8
Pensacola, Fla	19.0	15.7	18.8	14.6	13.8	18.1	12.7	14.9	13.0	14.7	19.2	15.1
Mobile, Ala	18.4	16.5	16.6	18.0	18.7	18.9	16.1	17.7	16.5	18.9	22.5	17.6
Montgomery, Ala	18.4	19.7	18.1	18.8	19.9	17.0	18.1	19.4	20.9	21.7	24.0	18.7
Vicksburg, Miss	17.9	18.6	16.1	18.8	18.4	18.9	19.1	20.8	19.6	19.2	21.3	17.9
New Orleans, La	18.3	16.2	14.1	13.5	12.5	11.8	12.8	13.7	13.0	13.1	14.5	13.7
Western Gulf States:												
Shreveport, La	18.2	18.6	20.0	20.8	18.6	21.2	21.9	21.7	20.8	20.4	22.3	19.0
Fort Smith, Ark	22.0	20.2	22.1	21.2	22.3	22.6	24.6	22.1	23.9	24.3	[5]22.6	17.1
Little Rock, Ark	16.7	18.3	17.5	17.6	18.0	19.1	20.8	20.4	19.0	18.5	19.7	14.9
Galveston, Tex	16.8	11.9	10.7	10.3	10.6	10.8	10.1	10.3	8.8	10.0	11.4	14.5
Indianola, Tex	17.3	15.5	13.4	13.3	13.7	12.9	13.5	12.6	10.2	10.8	11.0	16.9
Palestine, Tex	19.4	19.9	19.3	18.3	17.5	18.8	19.6	21.1	19.5	18.2	19.5	20.8
Rio Grande Valley:												
Brownsville, Tex	19.6	18.9	17.6	18.6	17.2	17.0	15.1	17.7	15.1	14.5	16.1	17.8
Rio Grande City, Tex	25.8	24.7	23.2	[6]23.8	23.1	25.9	27.9	25.9	20.3	17.1	16.4	18.5

[1] 30 days. [2] 20 days. [3] No record. [4] 26 days. [5] 28 days. [6] 27 days.

Mean daily range of temperature at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ohio Valley and Tennessee:	°	°	°	°	°	°	°	°	°	°	°	°
Chattanooga, Tenn	17.5	15.7	17.0	17.5	19.4	16.0	17.0	17.9	19.0	19.3	21.0	17.3
Knoxville, Tenn	18.5	16.9	18.8	19.4	21.0	18.7	18.3	20.8	22.0	23.4	23.1	17.6
Memphis, Tenn	16.2	17.5	16.0	16.2	17.2	15.3	16.8	16.6	17.1	17.6	19.6	15.9
Nashville, Tenn	18.0	16.9	15.8	17.2	17.7	15.4	17.1	19.5	19.6	20.0	22.0	18.3
Louisville, Ky	16.6	17.7	14.8	15.1	17.4	15.4	16.3	18.2	16.6	17.7	17.2	15.3
Indianapolis, Ind	15.8	15.7	15.1	15.9	17.2	16.5	17.1	18.5	17.0	16.6	16.8	14.5
Cincinnati, Ohio	15.1	16.2	12.7	13.8	14.4	14.2	18.9	15.4	14.7	15.9	16.8	15.7
Columbus, Ohio	15.5	15.4	14.4	17.7	18.4	19.5	18.0	19.9	19.3	17.8	17.5	16.2
Pittsburg, Pa	17.5	20.0	16.6	18.8	22.9	24.0	23.0	23.2	26.0	22.3	19.3	17.3
Lower Lakes:												
Buffalo, N. Y	14.6	17.8	14.4	15.2	16.0	17.4	18.1	15.4	14.2	14.6	13.1	11.7
Oswego, N. Y	15.6	16.1	12.6	12.0	18.8	19.4	15.1	18.2	18.8	18.9	15.5	14.1
Rochester, N. Y	14.5	17.0	13.8	14.8	18.1	20.1	15.5	19.2	20.5	18.0	15.7	15.8
Erie, Pa	15.5	17.8	([1])	15.0	18.5	17.5	14.0	16.2	15.0	15.0	14.3	12.0
Cleveland, Ohio	16.5	16.7	14.9	15.1	17,2	17.1	14.1	17.1	16.9	17.4	15.9	14.6
Sandusky, Ohio	14.0	14.6	12.8	12.8	17.5	15.2	15.4	15.0	14.8	14.3	18.7	13.8
Toledo, Ohio	16.7	14.2	14.7	15.1	17.7	16.4	16.2	17.1	16.5	17.5	16.7	13.4
Detroit, Mich	14.8	16.1	14.9	18.1	18.8	20.2	18.8	18.2	16.4	17.8	14.3	13.5
Upper Lakes:												
Alpena, Mich	15.3	15.4	17.5	14.9	17.1	18.0	17.9	17.1	19.0	16.6	12.6	13.0
Escanaba, Mich	18.6	19.4	22.7	16.5	16.5	18.2	17.6	15.8	14.2	15.2	15.1	12.9
Grand Haven, Mich	15.2	14.8	15.0	15.2	14.8	16.2	12.5	18.5	14.4	18.8	14.0	11.6
Mackinaw City, Mich	16.7	17.9	19.0	15.8	15.0	16.9	14.7	15.8	16.3	18.7	11.6	10.6
Marquette, Mich	20.5	23.2	22.9	17.6	16.9	23.0	16.4	19.1	17.7	18.6	15.6	15.4
Port Huron, Mich	16.0	15.5	14.5	13.7	17.8	19.0	17.5	18.6	18.3	17.6	14.6	13.4
Chicago, Ill	15.4	15.1	18.8	12.8	15.6	13.8	13.8	13.2	13.5	15.6	15.6	15.6
Milwaukee, Wis	15.9	16.3	13.9	12.4	17.5	16.3	15.4	14.9	14.7	15.3	15.5	14.3
Duluth, Minn	21.6	17.6	18.7	10.4	17.5	14.9	14.1	18.8	12.4	14.4	15.7	14.3
Upper Mississippi Valley:												
Saint Paul, Minn	23.8	22.8	19.2	18.4	21.0	20.1	20.3	19.9	18.4	18.0	17.4	15.7
La Crosse, Wis	18.0	17.3	15.3	16.3	15.4	15.6	14.8	15.4	15.4	14.7	15.6	12.8
Davenport, Iowa	22.0	22.5	21.9	23.0	21.7	21.0	21.0	20.8	16.0	15.9	17.2	14.0
Des Moines, Iowa	20.4	20.0	17.2	18.6	21.8	19.9	20.8	18.7	19.3	19.0	19.4	13.3
Dubuque, Iowa	18.5	18.6	16.8	21.5	21.8	21.2	22.1	21.2	19.8	17.3	19.5	15.4
Keokuk, Iowa	16.9	16.9	16.2	17.7	19.5	18.4	18.8	20.1	18.4	18.6	17.8	13.1
Cairo, Ill	16.2	15.6	13.5	14.4	15.1	13.5	15.0	16.2	15.2	16.8	16.5	13.4
Springfield, Ill	16.8	16.8	15.6	15.9	18.8	17.4	16.4	17.9	17.9	18.7	17.4	14.5
Saint Louis, Mo	17.8	18.7	15.1	16.1	17.0	15.5	15.4	15.9	15.0	16.6	18.8	15.0
Missouri Valley:												
Leavenworth, Kans	17.7	18.3	18.6	18.1	19.8	19.5	20.1	17.2	18.9	21.3	19.6	13.9
Omaha, Nebr	20.8	21.6	19.6	17.3	20.2	20.1	20.6	17.5	18.8	20.5	21.1	15.8
Bennett, Fort, Dak	26.6	23.4	22.4	22.8	26.7	26.0	24.1	27.4	28.9	28.1	31.0	20.2
Huron, Dak	26.5	25.0	21.0	20.2	24.6	24.1	22.8	24.2	25.9	24.6	25.8	18.0
Yankton, Dak	22.6	20.7	18.4	17.0	21.2	21.9	19.6	19.7	23.3	22.3	22.3	15.3
Extreme Northwest:												
Moorhead, Minn	25.1	22.9	22.5	18.6	24.4	24.4	22.8	22.6	20.2	20.9	18.8	15.6
Saint Vincent, Minn	24.7	22.5	23.0	19.2	27.2	25.1	22.4	23.5	21.9	21.1	19.2	19.6
Bismarck, Dak	22.1	18.7	19.4	17.4	23.1	26.4	22.0	22.8	20.2	23.2	22.6	15.1
Buford, Fort, Dak	23.7	25.6	21.2	23.1	[2]28.8	29.8	26.3	31.4	24.3	27.5	22.3	17.5
Totten, Fort, Dak	......	......	......	......	......	[3]25.5	24.1	24.8	23.2	23.6	20.7	16.7
Northern Slope:												
Assinaboine, Fort, Mont	20.2	18.4	25.2	24.6	28.3	24.2	24.0	29.3	20.8	25.6	24.4	19.1
Benton, Fort, Mont	20.4	21.4	18.8	[4]25.6	33.5	29.5	[5]28.2	34.4	[6]26.0	[4]27.8	28.7	21.2
Custer, Fort, Mont	23.8	19.7	20.9	26.0	28.9	28.9	29.9	32.6	26.0	29.9	27.8	18.7
Helena, Mont	14.7	15.0	15.0	17.6	21.6	20.1	20.5	22.7	16.5	19.0	16.2	14.0
Maginnis, Fort, Mont	17.1	18.2	15.7	18.8	22.8	21.4	21.9	22.6	19.2	23.7	20.4	13.6
Poplar River, Mont	[7]22.7	19.6	([1])	20.7	[5]28.4	28.1	25.5	32.5	[8]25.8	30.3	26.5	19.0
Shaw, Fort, Mont	18.6	19.1	21.3	23.0	28.5	25.1	25.0	30.1	22.2	24.2	23.6	17.2
Deadwood, Dak	19.5	20.1	16.1	14.2	18.8	18.9	19.8	19.1	18.4	20.6	18.9	17.7
Cheyenne, Wyo	21.1	20.0	20.6	22.5	26.1	29.1	29.5	26.0	30.0	29.5	25.4	26.4
North Platte, Nebr	23.8	22.1	19.6	18.6	20.7	21.7	21.6	20.7	23.6	25.0	26.5	18.0
Middle Slope:												
Denver, Colo	23.5	21.4	20.6	21.1	22.5	24.3	28.3	23.8	26.8	26.7	26.4	23.9
Pike's Peak, Colo	12.4	12.0	11.4	11.4	12.0	10.7	13.8	11.3	13.6	11.6	10.3	10.3
West Las Animas, Colo	32.6	29.7	32.1	29.2	29.1	28.8	32.1	29.2	34.0	33.2	34.6	26.5
Dodge City, Kans	26.0	22.8	25.7	25.5	23.1	21.5	22.1	19.9	23.6	22.2	24.1	17.0
Elliott, Fort, Tex	24.8	25.3	27.4	27.6	24.6	[2]22.5	25.9	21.8	25.5	21.8	25.2	19.5
Southern Slope:												
Concho, Fort, Tex	23.4	26.4	29.8	28.7	25.7	27.0	29.3	27.2	28.3	22.5	22.3	24.7

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[1] Record incomplete.
[2] 27 days.
[3] Made a station of the second order June 9, 1884.
[4] 28 days.
[5] 29 days.
[6] 26 days.
[7] 23 days.
[8] 25 days.

Mean daily range of temperature at stations of the Signal Service, &c.— Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Southern Slope—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°
Davis, Fort, Tex	25.9	27.3	25.8	25.7	29.9	27.0	27.8	25.6	23.4	22.2	25.6	25.6
Stockton, Fort, Tex	27.6	27.8	29.1	29.8	29.2	26.3	29.3	25.1	21.9	21.0	21.9	24.9
Southern Plateau:												
El Paso, Tex	29.3	24.9	29.1	32.4	36.4	35.8	32.6	28.9	26.0	22.0	28.5	24.5
Apache, Fort, Ariz	30.1	24.6	25.0	32.0	35.8	40.0	38.7	31.1	34.3	28.6	35.8	25.4
Grant, Fort, Tex	19.7	16.2	18.3	20.7	20.9	[1]22.8	22.3	22.6	22.1	18.8	22.0	20.2
Prescott, Ariz	24.7	20.9	20.2	24.1	27.5	32.8	31.1	28.0	29.4	27.2	33.0	22.4
Thomas, Camp, Ariz	26.9	24.0	25.8	31.2	35.0	38.3	33.0	28.6	32.2	25.8	31.5	24.8
Yuma, Ariz	21.9	18.8	21.4	[2]28.8	29.5	30.5	29.4	26.4	26.9	26.0	26.2	19.8
Middle Plateau:												
Salt Lake City, Utah	15.2	16.5	15.5	17.4	19.5	22.6	25.6	23.8	21.0	19.2	18.7	18.0
Northern Plateau:												
Boisé City, Idaho	26.6	17.5	16.0	19.5	22.5	22.3	25.2	27.1	19.7	20.7	19.1	16.1
Lewiston, Idaho	13.8	16.3	19.0	24.6	30.4	23.5	25.3	32.5	22.3	19.4	16.2	18.3
Dayton, Wash	18.9	18.8	18.9	24.8	29.8	26.7	28.8	35.3	24.4	21.8	15.8	16.4
Spokane Falls, Wash	[3]15.1	17.4	18.6	23.2	28.5	24.8	25.0	31.1	20.4	19.2	[4]13.8	15.0
North Pacific Coast:												
Canby, Fort, Wash	8.4	11.5	10.2	11.0	11.0	9.5	10.9	11.9	9.5	10.3	8.3	9.7
Olympia, Wash	9.5	14.6	18.1	20.1	26.2	22.5	22.6	23.4	10.0	15.1	9.7	11.5
Tatoosh Island, Wash	5.2	6.7	9.1	8.9	9.8	9.1	9.5	9.4	7.7	7.9	7.2	7.6
Portland, Oreg	13.0	15.0	17.8	19.8	24.9	21.2	19.1	24.2	17.1	17.1	13.7	12.0
Roseburg, Oreg	11.3	17.1	18.2	17.6	25.8	20.6	22.2	(5)	(6)	20.9	16.7	14.5
Middle Pacific Coast:												
Cape Mendocino, Cal	9.5	11.8	12.0	10.3	11.0	11.0	9.9	11.8	10.8	11.8	11.3	9.5
Red Bluff, Cal	16.6	18.6	17.7	19.4	28.1	22.4	28.4	29.6	25.8	[7]25.3	23.7	16.4
Sacramento, Cal	18.0	17.2	14.0	16.4	19.8	18.7	25.2	27.9	26.0	22.6	22.9	14.6
San Francisco, Cal	8.1	10.3	9.8	10.4	11.8	9.9	12.7	11.0	10.7	11.4	9.9	7.9
South Pacific Coast:												
Los Angeles, Cal	21.5	16.5	16.1	19.3	18.4	21.1	28.3	27.0	25.7	23.1	25.2	17.2
San Diego, Cal	19.0	14.4	12.5	13.3	11.4	13.7	14.6	14.1	12.9	14.6	18.1	13.7
Alaska Stations:												
Saint Michael's, Fort, Alaska	15.5	15.4	13.1	12.3	12.2	18.6	9.3	11.8	9.5	11.0	12.7	14.9
Sitka, Alaska	9.6	12.0	9.8	14.0	11.0	11.4	11.5	11.3	13.1	10.9	9.4	11.0
Unalashka, Alaska	9.2	6.9	11.0	13.0	11.9	12.6	12.8	9.8	11.2	10.7	8.4	8.9
Behring's Island, Behring Sea	8.6	8.4	8.5	9.1	9.0	9.3	9.0	7.5	10.7	9.0	8.3	9.3

[1] 22 days. [2] 29 days. [3] 26 days. [4] 28 days. [5] Record incomplete. [6] No record. [7] 27 days.

APPENDIX 14

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of the mencement of observations at each,

[From self-regis-

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
New England:										
Eastport, Me	51	1874	47	1874, 1878	53	1878	63	1877	80	1877
Portland, Me	58	1876	58	1880	65	1874	78	1881	94	1880
Mount Washington, N. H	42	1874	43	1883	47	1876	50	1883	62	1879, 1880
Boston, Mass	69.5	1876	64	1880	72	1880	85	1872	97	1880
Thatcher's Island, Mass	60	1880	60	1880	66	1880	76	1881	86	1880
Block Island, R. I	56	1883	54	1884	55.3	1884	62	1883	78.3	1881
Narragansett Pier, R. I	48	1884	52	1883	60	1884	66	1882	75	1883, 1884
Point Judith, R. I	50	1884	47	1884	58.2	1884	59	1883, 1884	70	1884
New Haven, Conn	63	1876	65	1880	69	1880	75	1880	89	1880
New London, Conn	65	1880	62	1880	64	1878	74	1880	89	1881
Middle Atlantic States:										
Albany, N. Y	59	1876	58	1880	64	1878	80	1881	92	1880
New York City	64	1876, 1880	69	1874	72	1879	81	1872, 1877	94	1880
Philadelphia, Pa	67	1876	75	1874	75	1880	87	1872	96	1880
Atlantic City, N. J	64	1880	71	1880	72	1880	79	1878	89	1877, 1880, 1881
Barnegat City, N. J	61	1874 1879, 1880	70	1880	78	1880	79	1880	91	1880
Cape May, N. J	58	1874, 1876	59	1880	65	1880	76	1879	81	1874, 1880
Little Egg Harbor, N. J	51.4	1884	61	1883	61	1883	74	1882	90.3	1884
Sandy Hook, N. J	63	1874	71	1874	67	1880	77	1880	93	1880
Delaware Breakwater, Del	56	1882	66	1880	78	1880	79	1880	89	1880
Baltimore, Md	71	1876	78	1874	76	1880	84	1881	95	1881
Ocean City, Md	53	1883	71	1883	65	1883	74	1883	85.7	1884
Washington City	71	1874, 1876	78	1874	79	1880	90	1872	96	1880
Cape Henry, Va	78	1876	80	1880	83	1879	85	1876, 1878, 1880, 1881	98	1875
Chincoteague, Va	60	1882	71	1883	72.2	1882	79	1881	88	1881
Lynchburg, Va	72	1876, 1879	75	1874	79	1879	91.5	1873	94	1877
Norfolk, Va	80	1871	81	1871	81	1880	92	1871	98	1880
South Atlantic States:										
Charlotte, N. C	70	1879, 1880	76.5	1883	79	1880	85	1880, 1881	94.4	1881
Hatteras, N. C	68	1884	71	1884	69.8	1884	75	1881	88	1881
Kitty Hawk, N. C	73	1876	77	1880	80	1878, 1880	84	1878, 1880	98	1880

APPENDIX 14.

Signal Service, United States Army, for each month and the year. (Compiled from the com-
to and including December, 1884.)

tering thermometers.]

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
82	1884	86	1873, 1880	88	1880	82.8	1884	80	1879	64	1882	54	1877	88	1880
94	1878	97	1876	95	1876	94.5	1881	83	1879, 1881	66	1882	50	1884	97	1876
71	1878	72	1881	74	1872	65	1880	59	1871	47.8	1881	43	1884	74	1881
96	1874	101	1880	96.8	1881	101.5	1881	90	1881	75	1876	66	1881	101.5	1881
87.7	1884	89.9	1882	85	1876, 1879, 1880	95	1881	81	1879	66	1882	67.4	1881	95	1881
82.6	1884	86	1881, 1882	82	1882	86.5	1881	75.4	1881	70	1881	60	1884	86.5	1881
91	1884	89	1882	91	1882	89	1882	79	1884	72	1882	59	1884	91	1884
78	1883	84	1883	82	1883	80	1884	72	1884	70	1882	58	1884	84	1883
92	1880, 1884	95	1876	90	1873, 1876, 1881, 1884	100	1881	86	1881	71.5	1882	62	1875	100	1881
89	1880	93	1876, 1878	90	1878	92	1881	82.7	1879	72	1882	60.5	1879	93	1876, 1878
92	1874	94	1883	93	1876	96	1881	84	1881	70	1876	68	1881	96	1881
95	1875	99	1876	96	1881	100.2	1881	88.8	1881	74	1882	66.2	1881	100.2	1881
97	1874	100	1876	99	1881	101.5	1881	87	1879, 1881	77	1876	70	1873	101.5	1881
98	1874, 1880, 1881	99	1880	91.8	1881	94	1880	88	1881, 1884	72	1882	64	1877	99	1880
95.6	1882	96	1879	95	1874	96	1881	82.5	1881	78	1879	68	1875	96	1879, 1881
89	1873, 1880	91	1872	88	1873, 1877	87	1880	85.7	1884	69	1879, 1884	62	1881	91	1872
96	1882	99	1882	98	1882	95	1882	81.6	1884	75	1882	59.4	1884	99	1882
97	1874	100	1876	96.2	1881	101	1881	87	1881	78	1881	68.5	1881	101	1881
89	1880	91	1880	93	1881	93	1881	84	1881	78	1881	69	1881	93	1881
97.5	1874	99	1876, 1879, 1880	98	1881	101	1881	89	1879, 1881	78	1879	71	1881	101	1881
89	1883	88	1884	89	1882	85.6	1884	83.9	1884	68	1884	61	1884	89	1882, 1883
102.5	1874	102	1879	101	1881	104.3	1881	92.8	1881	80	1879	73	1873	104.3	1881
96	1874	101	1875, 1878	103	1881	94	1875, 1877, 1881	89	1879, 1881, 1883	81	1876, 1879, 1883	76	1875	103	1881
93	1880	94.5	1884	91	1881	87.8	1884	84.2	1884	79	1882	64	1881	94.5	1884
97	1874	101.8	1881	100	1881	98.8	1881	91.3	1884	80.2	1882	73	1873	101.8	1881
102	1874	102.5	1876	99	1881	96	1880	89	1881, 1884	80	1879	73	1873, 1874, 1875, 1879	102.5	1876
97	1881	101	1879	100.5	1881	94	1881	91.9	1884	80	1879	71	1884	101	1879
91	1882	92	1881	92	1881, 1883	90	1881	90	1881	79	1882	71	1884	92	1881, 1883
99	1880	100	1876	99	1881	95	1880	90	1881	79	1879	78	1875, 1879	100	1876

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
South Atlantic States—Cont'd:										
Macon, Fort, N. C	63	1882	70	1882	70.7	1884	74.3	1884	91	1881
New River Inlet, N. C	69	1883	71	1884	75	1884	88.9	1884	86.1	1884
Scott's Hill, N. C	69	1884	78	1883	80.8	1884	85.5	1884	84.5	1884
Smithville, N. C	73	1876	72	1880	75	1884	85.6	1884	90	1881
Wilmington, N. C	77	1879	81	1880	84	1878	90	1880	95	1878
Charleston, S. C	80	1879	78	1876, 1880, 1882	85	1882	87	1880	94	1878
Augusta, Ga	79	1879	82	1883	89.3	1882	90	1880	100	1878
Savannah, Ga	80	1879	80	1876, 1880, 1883	87	1882	89	1873	98	1878
Jacksonville, Fla	80	1875, 1876, 1877, 1879	83	1876, 1883	88	1882	91	1874, 1880	98.5	1878
Florida Peninsula:										
Cedar Keys, Fla	77	1880	79	1588	82	1882	88	1880	91	1880, 1881
Key West, Fla	90	1877	87	1874	89	1878, 1874	91	1881	93.2	1881
Sanford, Fla	86	1883	86	1883	88.5	1884	91.5	1884	94.7	1884
Eastern Gulf States:										
Atlanta, Ga	78	1879, 1882	74.5	1883	81	1882	86	1880	91	1879
Pensacola, Fla	78.6	1882	78.3	1883	82.7	1884	87.2	1883	93	1881
Mobile, Ala	78	1882	78	1883	85	1879	90	1881, 1883	98	1878
Montgomery, Ala	78.5	1882	81.2	1883	86.3	1882	90	1880	98	1875
Vicksburg, Miss	80	1879	83.1	1883	85	1878, 1880	90	1881	95	1874, 1877
New Orleans, La	78	1879	80	1883	84	1879	86	1882	92	1877
Western Gulf States:										
Shreveport, La	78	1876, 1880	80.5	1876	90	1882	93	1880, 1882	101	1875
Fort Smith, Ark	68.6	1884	78.4	1883	82.8	1884	88.5	1883	93.3	1883
Little Rock, Ark	78	1880	77	1882	83	1882	94	1860	91	1880
Galveston, Tex	75	1876, 1880, 1882	75	1882, 1884	85	1879	85	1878	91	1875, 1877
Indianola, Tex	80	1880	80	1875, 1880	90	1879	91	1877	95	1879
Palestine, Tex	76.5	1884	78	1882	84	1882	87.5	1883	90	1883
Rio Grande Valley:										
Brownsville, Tex	83	1876	85	1876	92.3	1884	97	1878, 1879	99	1877
Rio Grande City, Tex	90	1879	92	1882, 1884	98.2	1884	109	1878	112	1879
Ohio Valley and Tennessee:										
Chattanooga, Tenn	78	1879	74	1880	82.5	1882	88	1880	93	1879
Knoxville, Tenn	74	1876	79	1871	83	1882	88	1872	94	1877
Memphis, Tenn	78	1876, 1880	79	1883	85	1879	88	1882	96	1879
Nashville, Tenn	74	1879	77.4	1883	81.7	1882	90	1872	93	1874, 1879
Louisville, Ky	71	1876	77.5	1883	70	1879	88.5	1883	93	1881
Indianapolis, Ind	69	1876	72	1883	77	1875	85.3	1883	89	1874, 1881

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
88	1881	89.5	1883	91	1883	87	1881	87	1881	78	1882	69	1881	91	1881, 1883
89	1883	94	1883	94	1883	93	1883	93.1	1884	77.2	1883	72	1884	94	1883
93	1883	100	1883	96	1883	92	1882	90	1883	81.1	1883	73	1884	100	1883
97	1880	100	1879	97.5	1876	93	1876	86.5	1884	78	1877	71	1875	100	1879
100	1880	103	1879	99	1878	96	1872	92.5	1884	83	1877, 1879	78	1879	103	1879
100	1877, 1880	104	1879	97.5	1881	94	1876	93	1883	82	1879	76	1881	104	1879
101.8	1881	105	1878	105	1878	97	1875	93.5	1884	84	1879	77	1874, 1875, 1880	105	1878
100	1880	105	1879	100	1878	96	1876, 1877	92	1884	82	1875	80	1875	105	1879
100.5	1880	104	1879	100	1874	98	1875	92	1883	84	1875, 1877	81	1875	104	1879
94	1880	94	1880, 1881	96	1883	94	1881	89	1881, 1884	81	1881, 1882	78	1881	96	1883
95.5	1881	97	1880	95.4	1881	95	1872	92	1876	91	1876	88	1876	97	1880
96	1883	99.4	1883	96.9	1883	94.8	1884	94	1884	85.6	1884	84.6	1884	99.4	1883
94.8	1881	97.5	1881	96.2	1881	90.5	1881	90.8	1884	80.5	1882	71	1879	97.5	1881
97	1881	97.2	1884	94	1884	93.5	1884	95.2	1884	81.8	1882	76	1880	97.2	1884
100	1877, 1882	101	1883	100	1874	96	1881	93.4	1884	82	1882	78.8	1884	101	1883
105.5	1881	106.9	1881	103	1874	97	1875, 1877, 1884	96.1	1884	83	1879, 1882	77.1	1884	106.9	1881
101	1881	100	1878, 1881	100	1878	98	1881	98.7	1884	84.5	1882	79	1873, 1875	101	1881
97	1881	96	1877	96.5	1877	92.3	1884	90	1884	82	1879, 1882	78	1871, 18 5, 1879, 1880	97	1881
104	1875	107	1875	105	1881	101	1881	95	1883	86	1882	79	1875	107	1875
101	1882	104.5	1884	103.7	1884	99.9	1884	94.6	1884	86	1882	78.1	1883	104.5	1884
98	1882	101.3	1884	102	1881	97	1881	90	1881, 1883, 1884	83	1882	74	1880, 1883	102	1881
97	1875	97	1875	98.5	1874	94	1875, 1876	87.2	1884	82	1875, 1876	75	1879, 1881, 1883	98.5	1874
98	1878	98	1872, 1876, 1879, 1884	100	1874, 1877	96	1877	93	1877	87.8	1882	79	1879	100	1874, 1877
96	1882	98.2	1884	97.9	1884	95.5	1883	94	1883	86	1882	76.2	1884	98.2	1884
102	1878	98	1877, 1883	101	1877 1883	96	1877, 1878, 1879, 1883, 1884	95	1877	89	1882	83	1875, 1880	102	1878
109	1883	110	1884	112	1877	107	1877	105	1877	92.7	1883	88	1880	112	1877, 1879
95	1881	101	1879	100.5	1881	96	1881	90.8	1884	78	1882	72	1879	101	1879
96	1880	100	1879	100	1881	97.1	1881	94	1884	80.5	1881	75	1874	100	1879, 1881
100	1881	99	1875, 1879, 1881	102	1881	98	1881	92	1879, 1884	82	1879	74	1875	102	1881
99	1874	101.2	1881	104	1874	98.2	1881	91.9	1884	80.6	1882	75	1874	104	1874
100	1874	102	1874	104.6	1881	99	1881	90	1884	78	1879	74	1875	104.6	1881
96	1874	101	1881	101	1881	94.5	1881	87	1884	75	1879	68	1875	101	1881

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Ohio Valley and Tennessee—Cont'd.										
Cincinnati, Ohio	69	1876	73	1883	77	1875	85	1872, 1873	94	1874, 1875
Columbus, Ohio	64	1880	72	1883	71	1879	86	1883	92	1881
Pittsburg, Pa	75	1874	76.5	1883	80	1876	88	1878	95	1881
Lower Lakes:										
Buffalo, N. Y	65.5	1874	63.8	1883	72	1875	82.6	1883	87	1876
Oswego, N. Y	64	1874	61	1880	67	1871	78	1872, 1884	94	1879
Rochester, N. Y	69	1874	63	1875	69	1875	83.5	1883	90	1879
Erie, Pa	73	1876	70	1883	78	1875	86	1883	91	1879
Cleveland, Ohio	70	1874	72	1883	76	1875	85	1872, 1883	92	1879
Sandusky, Ohio	64	1880	70	1883	70	1878, 1879	80	1878	92	1879
Toledo, Ohio	66	1873, 1876	65	1883	75	1875	85	1872	95	1871
Detroit, Mich	65	1876	64.3	1884	75	1875	78.5	1883	90.5	1881
Upper Lakes:										
Alpena, Mich	52	1876, 1880	58	1880	66	1879	76	1881	91	1874
Escanaba, Mich	45	1879	52	1877	57	1879	65	1875, 1880	83	1881
Grand Haven, Mich	57	1880	58	1880	71	1878	80	1883	86	1877
Mackinaw City, Mich	39.8	1884	43	1883	52.2	1884	66.1	1884	79.5	1883
Marquette, Mich	56	1880	69	1877	70	1878	81	1877	92	1879
Port Huron, Mich	64	1876	59	1880	73	1875	81.4	1883	88	1881
Chicago, Ill	65	1876	63	1876, 1880	73	1875	83	1873	89	1874
Milwaukee, Wis	59	1871	60	1882	70	1878	82	1871	90	1874
Duluth, Minn	51	1877	57	1877	62	1878, 1879	75	1881	91	1874
Upper Mississippi Valley:										
Saint Paul, Minn	49	1879	59	1880	68	1879	82	1879, 1882	94	1874
La Crosse, Wis	59	1874	65	1882	72	1875	83	1879	96	1874
Davenport, Iowa	60	1874	66.7	1882	74	1875	81	1879	90	1874
Des Moines, Iowa	63	1880	68	1880	80	1880	89	1883	93	1880
Dubuque, Iowa	62	1874	67.2	1882	75	1875	84	1879	94	1874
Keokuk, Iowa	64	1874	69	1882	80	1875	85	1883	92	1874
Cairo, Ill	70	1876, 1880	74	1883	84	1879	89	1872	92	1874
Springfield, Ill	64	1880	72	1882	73	1882, 1883	85	1883	88	1881
Saint Louis, Mo	72	1880	73.2	1882	82	1879	87.5	1883	93	1874
Missouri Valley:										
Leavenworth, Kans	65	1876	73	1876	84	1879	89	1880	94	1874, 1875
Omaha, Nebr	62	1879, 1880	66	1880	82	1879	89	1880	92	1880
Bennett, Fort, Dak	55	1882	63	1882	78	1882	86	1882	92	1881
Huron, Dak	45.5	1882	57.2	1882	74.8	1882	81.2	1882	83	1884
Sully, Fort, Dak	55	1876, 1882	67	1882	76	1883	93	1884	101	1874
Yankton, Dak	67	1880	68	1876	87	1879	89	1874	94	1880
Extreme Northwest:										
Moorhead, Minn	43	1884	49	1882	53	1884	74	1883	88	1881
Saint Vincent, Minn	36.3	1884	42	1882	49	1881	73	1881	85.1	1884
Bismarck, Dak	49	1880	60	1877, 1882	72	1878	80	1881	92	1880
Buford, Fort, Dak	47	1880	57	1882	70	1879, 1882	92	1881	95	1880

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
98.5	1874	103.5	1881	101	1881	95	1881	87.7	1884	75	1879	72	1875	103.5	1881
93	1879	103	1881	98	1881	98	1881	87	1884	74	1879	63	1881	103	1881
98	1874	102.7	1881	99.8	1881	101.6	1881	91.1	1884	79	1876	69	1873, 1875, 1880	102.7	1881
92	1878	90	1878	90.8	1881	88.1	1884	83	1879	68.3	1881	62	1875	92	1878
98	1875	100	1878	97.5	1883	93.4	1881	84	1877	71	1876	65	1875	100	1878
94	1875	96	1881	96	1874, 1881	98	1881	87	1879	71	1876, 1879	70	1875	98	1881
91	1874, 1875	94	1878	93	1881	92	1881	85	1879	73	1882	68	1875	94	1878
96	1874	96	1878	98.7	1881	98	1881	87	1879	72.5	1882	68	1875	98.7	1881
92	1880	96	1879	98	1881	95.8	1881	87	1879	75	1879	63	1879	98	1881
99	1872	97	1872, 1874	97	1881	95	1881	86	1872	72	1876, 1882	66	1875	99	1872
98	1874	100	1878	98.8	1881	97	1874	85	1879, 1884	69	1879, 1882	65	1875	100	1878
97	1874	97	1876	92	1878	93	1884	84	1884	63	1874	56	1875	97	1874, 1876
88	1874, 1881	92	1874, 1878	89	1876, 1878	84	1880	77.6	1884	62.6	1884	48	1875	92	1874, 1878
88	1874	90	1878	92	1881	85	1878, 1881	80	1879	69	1874	61	1877	92	1881
81.4	1884	80.2	1883	89.4	1884	88.9	1884	79	1884	60	1882	51.5	1883	89.4	1884
95	1879	100	1878	96	1879	97	1874	87	1879	66	1874	59	1875	100	1878
90	1878, 1879	95	1878	96.5	1881	97	1881	86	1879	67.6	1882	65	1875	97	1881
98	1872	99	1874	98	1874	93.9	1881	84	1879	72	1874, 1882	68	1875	99	1874
94	1872, 1874	95	1871, 1874, 1878	98	1874	94	1872, 1874	83.1	1884	70	1874, 1882	63	1877	98	1874
92.2	1883	99	1883	93	1881	90	1874	78	1879	65	1874	51	1883	99	1883
94	1874	100	1883	98	1880	94	1878	87	1879	72	1874	56	1877	100	1883
98	1874	101	1874	96	1874, 1881	92	1873	84	1879, 1884	70	1874	60	1877	101	1874
98	1874	98	1874	96.8	1881	94	1881	85	1879	71	1874, 1879	63	1877	98	1874
95.5	1881	98.5	1881	108	1881	93	1881	85.8	1884	71	1882	57	1883	108	1881
98	1874	101	1874	97.3	1881	94.2	1881	86	1879	69	1874, 1879	64	1877	101	1874
98	1873	100	1874	102	1873	97	1881	87	1879	74	1874, 1882	68	1875	102	1873
98	1872	99	1874, 1881	103	1881	97	1881	86	1872, 1881, 1884	80.5	1882	72	1875	103	1881
94	1881	101.5	1879	99.5	1881	94.7	1881	88	1879	76	1879	64	1883	101.5	1879
98	1881	104	1881	106.4	1881	101.5	1881	90	1879	82	1879	74	1875	106.4	1881
99	1875	104	1874	107	1874	101	1882	89	1871, 1874	77	1874	72	1875	107	1874
98	1881	105	1874	105	1874	98.8	1881	87	1879	74	1874	66	1875	105	1874
98	1881	101	1881	104	1881, 1882	95	1882, 1883	90	1880	69.8	1884	62	1881	104	1881, 1882
94.1	1883	99.2	1883	95.6	1881	95.9	1884	81.8	1884	66.9	1884	58	1881	99.2	1883
111	1874, 1876	106	1874	107	1876, 1881	107	1874	88.3	1884	70	1883	65	1873	111	1874, 1876
97	1876	103	1883	103	1873	100	1881	89	1879	76	1876	62	1875	103	1873, 1883
100.3	1883	95.1	1881	93.5	1882	88	1882	77.7	1884	56.3	1884	55	1883	100.3	1883
93	1883	93	1883	90	1882	89	1883	77	1880	58.7	1884	44.8	1884	93	1883
99	1883	102	1881	105	1876	94	1882	88	1879	67	1876	60	1881	105	1876
107	1883	104	1881	107	1882	100	1882	95	1879	62	1879	56.8	1884	107	1882, 1883

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Northern Slope:										
Assinaboine, Fort, Mont	46	1882	56	1882	67	1882	81	1881	86.1	1884
Benton, Fort, Mont	58	1880	62	1882	74	1882	81	1880	93	1875
Custer, Fort, Mont	60	1880	65	1881	76	1882	85	1881	84	1880, 1881, 1882, 1883, 1884
Helena, Mont	51.2	1884	60	1881	66	1881	73	1881	77	1880, 1881, 1882
Maginnis, Fort, Mont	48.1	1884	57	1883	58	1883	65.8	1884	78.4	1884
Shaw, Fort, Mont	51	1884	58	1883	71	1882	80	1880	84	1881
Deadwood, Dak	62	1883	62	1883	73	1882	82	1881	84	1880
Cheyenne, Wyo	68	1880	59	1879, 1880, 1881	77	1879	80	1874	88	1874
North Platte, Nebr	70	1880	68.3	1882	86	1879	92	1880	94	1880
Middle Slope:										
Denver, Colo	67	1882	72	1879	81	1879	83	1874	92	1874
Pike's Peak, Colo	30	1879	29	1876	43	1879	39	1876	47	1880
West Las Animas, Colo	68.2	1884	71.2	1884	79.3	1884	82.5	1882, 1883	91	1883
Dodge City, Kans	70	1876	78	1876	89	1879	92	1880	98	1879, 1880
Reno, Fort, Ind. T	72	1884	73	1884	82	1883	91	1883	90	1884
Elliott, Fort, Tex	81	1880	78	1880	86	1880	96	1880	94	1880
Southern Slope:										
Sill, Fort, Ind. T	75	1880	79	1879, 1880	95	1879	96	1880	97	1880
Concho, Fort, Tex	78	1879	87	1880	97	1879	98	1880	107	1879
Davis, Fort, Tex	77	1880	79	1879	87	1879	95	1879	101	1881
Stockton, Fort, Tex	82	1880	83	1879	92	1879	101	1879	104	1879
Southern Plateau:										
Santa Fe, N. Mex	76	1879	73	1879	82	1879	84	1879	89	1872
El Paso, Tex	74	1880, 1881	82	1879	88	1879, 1882	98	1879	102.8	1884
Apache, Fort, Ariz	67	1881, 1882	74	1881	83	1879	89	1879	93	1881
Grant, Fort, Ariz	77	1879	80	1879	87	1879	93	1879	94	1879
Phœnix, Ariz	86.7	1883	87.5	1884	94	1879	104.9	1882	107.2	1883
Prescott, Ariz	71	1882	80	1879	90	1879	86	1879	90	1878
San Carlos Agency, Ariz	72	1883	79	1884	87	1882	95	1882	102	1883
Thomas, Camp, Ariz	70	1881	75	1881	85	1881	92	1881	97	1881
Verde, Fort, Ariz	73	1879	81	1879	90	1881	96	1879	98.5	1884
Wickenburg, Ariz	76	1879	82	1879	92	1879	98	1879	97	1884
Yuma, Ariz	80	1879	90	1879	100	1879	105	1876	108.7	1883
Middle Plateau:										
Winnemucca, Nev	57	1878	69	1879	82	1879	79	1881	86	1881, 1882, 1883
Salt Lake City, Utah	54	1879	68	1879	77	1879	83	1874	91	1874
Northern Plateau:										
Boisé City, Idaho	61.5	1884	64	1879	76	1881	80	1879	88	1881
Cœur d'Alene, Fort, Idaho	50	1884	60	1884	80	1884	78	1884	85	1884
Lewiston, Idaho	59	1880	63	1881	78.5	1882	86	1880	92	1884
Dayton, Wash	61	1880	64	1881	83	1881	91	1880	90	1880
Spokane Falls, Wash	50.9	1884	52	1881	74	1881	73	1884	88.8	1884
North Pacific Coast:										
Canby, Fort, Wash	55	1884	68	1884	64.2	1884	78.2	1884	76	1884
Olympia, Wash	54	1884	59.1	1884	71	1881	82	1880	87	1878, 1884
Portland, Oreg	59.2	1881	64.7	1884	76.5	1881	85	1880	90	1884
Roseburg, Oreg	65	1878	68.7	1883	80	1881, 1883	84.5	1880	88.2	1884

of the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
101	1883	95	1882	98	1882	86	1882	83	1884	68.1	1884	63.8	1884	101	1883
101	1881	107	1881	108	1881	95	1881	87	1875	71.6	1884	69.2	1884	108	1881
107	1883	103	1881	106	1882	96	1883	87	1879	69	1879	61	1881	107	1883
96	1880	98	1880	95	1880	86	1880	75	1880	62	1884	52	1883, 1884	98	1880
93	1883	92	1882	100	1882	88	1882	76.2	1884	69.3	1884	68.4	1884	100	1882
96	1880	96	1881, 1882	99	1881	91	1880	80	1880	67	1884	62.2	1884	99	1881
96	1880, 1881	102	1881	101	1881	91	1881	77	1880	68	1878	58.7	1883	102	1881
97	1880, 1881	100.5	1881	96.1	1882	88	1875	80	1878, 1874, 1879	69	1872, 1876	64	1877	100.5	1881
101	1876	107	1877	103	1878	101	1881	89	1879	79	1876	67	1878	107	1877
99	1873	102.3	1874	105	1878	93	1878	86	1878	76	1876, 1879	71	1874	105	1878
63	1881	64	1879	62	1878	55	1875	47	1879	38	1878, 1879	30	1877	64	1879
100	1882	104	1883, 1884	101	1882, 1884	97.5	1883	90.5	1884	77	1883	69.7	1884	104	1883, 1884
102	1880	108	1876	101.6	1881	99.8	1881	90	1883	83	1875	73	1875	108	1876
96	1884	105	1884	99.9	1884	98	1883	91	1884	83	1883	74	1883	105	1884
100	1880, 1881	102	1881	101	1881	98	1881	88	1880	81	1882	86	1880	102	1881
105	1881	107	1884	105	1881	100	1881	91	1878, 1884	88	1879	77	1880	107	1884
110	1882	108	1879	103.4	1883	100	1879	97	1877	85	1882	80	1879, 1880	110	1882
111	1881	110	1881	100	1884	94	1883	90	1881	81.6	1883	80	1881	111	1881
106.6	1881	107.4	1884	105	1877	100	1879	96	1878	87.6	1883	81	1879, 1881	107.4	1884
93	1881	95.5	1878	97	1878	90	1879	85	1878	77	1878	65	1878	95.5	1878
113	1883	111	1884	110.2	1884	104	1879	94	1879	82	1882	74.8	1881	113	1883
101	1883	102.5	1881	98	1879	96	1883	85.3	1884	77	1882	70	1881, 1882	102.5	1881
101.5	1883	100.9	1884	108	1879	98	1879	91	1878	79	1878, 1879	74	1878	108	1879
119	1883	114.6	1884	116	1883	114	1883	100.3	1884	97.3	1884	94.6	1882	119	1883
102	1878	103	1878	99	1878	100	1879	86	1881	75	1878	70	1881	103	1878
112	1883	114	1884	110	1884	108	1883	98	1881	82	1882	73	1881	114	1884
109	1883	112.5	1884	106.5	1884	100	1883	89.5	1883, 1884	81.5	1882	72	1881	112.5	1884
109.5	1881	114	1881	106	1878	104	1877	95	1881	80	1878	71	1878	114	1881
111	1884	112	1884	111	1877	108	1877	95	1877	86	1884	82	1884	112	1884
117	1883	118	1878	115	1879	113	1879	102	1876, 1879	91	1879	80	1878	118	1878
95	1881	104	1877	102.5	1882	94	1878, 1880	84	1879	67	1879	65	1878	104	1877
100	1883	98	1877	101	1875	93	1875	83	1876	70	1882	61	1874	101	1875
98	1883	106	1877	105	1883	96	1878	85	1879, 1880	70	1878	59	1879	106	1877
94	1883	95	1883	100	1882	89	1882	71	1883	59	1883	50	1883	100	1882
98	1883	104.8	1882	106.6	1882	93.5	1883	84	1880	63.2	1883	63	1879	106.6	1882
97.5	1884	102	1880	101.8	1884	91.3	1881	92	1880	66	1883	59.8	1881	102	1880
95.4	1883	97.5	1882	101.5	1882	87	1883	70.5	1884	58	1881	50	1881	101.5	1882
88	1884	73.2	1884	90.3	1884	86.4	1883	67	1884	64	1884	57	1883	90.3	1884
95	1878	93.5	1880	92	1884	81	1877, 1879	73	1880	63	1884	59	1880	95	1878
99	1876	95.5	1875	94.2	1884	90	1876	79	1876	68	1873	63	1875, 1880	99	1876
96.5	1878	97	1880	97.2	1884	90	1877, 1879	76	1877, 1880	69.7	1884	65	1880	97.2	1884

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Middle Pacific Coast:										
Cape Mendocino, Cal	61.5	1884	68.5	1884	69	1883	63.1	1884	74	1883
Red Bluff, Cal	71.5	1880	80	1883	85	1881	90	1878	101.4	1883
Sacramento, Cal	64	1881	78.5	1879	80	1882	84	1881	98	1883
San Francisco, Cal	69	1877	71	1884	77	1879	81	1875	86	1883
South Pacific Coast:										
Los Angeles, Cal	82	1883	86	1881	99	1879	94	1881	100	1883
San Diego, Cal	78	1877	82.6	1883	99	1879	87	1876	94	1879
Alaska Stations:										
Alexander, Fort, Alaska	40	1882, 1883	37	1883	41	1883	48	1882	61	1882
Atka, Alaska	45	1884	46	1884	45	1883	52	1882, 1884	52	1882, 1884
Hoochnahoo, Alaska	47	1884	47	1884	51	1883	63	1883	76	1883
Pyramid Harbor, Alaska	48	1884	48	1883	50	1883	68	1883	70	1882
Saint Michael's, Fort, Alaska	43.6	1883	41	1883	43.5	1884	44	1882	57	1877
Sitka, Alaska	50.8	1882, 1883	52.5	1884	55.8	1883	65.7	1883	69.2	1882
Unalashka, Alaska	52	1882	51	1882	50	1882, 1884	59	1884	60	1883
Behring's Island, Behring Sea	36.6	1884	38	1883	38.9	1884	39.5	1884	56	1883

of the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
83	1883	69	1883	69	1882	90	1883	75.8	1884	78	1872	71	1883	90	1883
105	1878	110	1879	110.5	1878	106	1877	94	1877	80	1879	74	1882	110.5	1878
102.5	1883	103.5	1883	103	1879	101	1883	88	1877	76	1880	68	1882	103.5	1883
95.2	1883	83	1881, 1884	89	1879	92	1877	84	1871	78	1871	68	1878	95.2	1883
108.5	1879	99	1884	101.5	1884	103.5	1883	96.5	1879	88	1884	88.2	1878	108.5	1879, 1883
94	1877	86	1877	91.5	1884	101	1883	92	1879	85	1873	82	1874	101	1883
78	1882	69	1882, 1884	78	1884	66	1882	65	1881	47	1881	43	1884	78	1882, 1884
72	1883	72	1883	68	1882, 1883	62	1882	54	1881, 1884	57	1883	45	1881	72	1883
76	1883	79	1883	75	1884	65	1884	56	1881, 1882, 1883	53	1884	54	1884	79	1883
78	1884	78	1884	74	1882, 1883	69	1883	65	1881	49	1884	49	1884	78	1884
75	1876	75	1877	69	1884	66.5	1883	60	1881	42	1874	45	1878	77	1876, 1877
74.6	1884	67.5	1883, 1884	79	1881	69.4	1883	60.8	1882	55.8	1884	56.3	1884	79	1881
66	1884	78	1882	78	1881	68	1881	62	1881	58	1881	50	1881	78	1881, 1882
60.7	1882	62.7	1884	63.6	1882	58.5	1882	49.9	1884	42.9	1883	40.7	1883	63.6	1882

APPENDIX 15.

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of the mencement of observations at each,

[From self-register

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
New England:										
Eastport, Me	—20	1874	—20	1876	—4	1883	2	1874	29	1882
Portland, Me	—11.5	1882	—7	1874, 1876	—7	1872	14	1874	34	1873, 1876
Mount Washington, N. H	—46	1875	—4.2	1876	—49	1872	—18	1874	—1	1880
Boston, Mass	—13	1882	—6.5	1876	—7.5	1872	11	1874	31	1882
Thatcher's Island, Mass	—8	1882	—4	1880, 1881	4.5	1884	18	1881	31	1880
Block Island, R. I	—4	1882	2	1881	10	1883, 1884	25	1881	36	1882
Narragansett Pier, R. I	1	1883	4	1884	4	1884	23	1882, 1883	33	1884
Point Judith, R. I	1	1883	5	1884	5.7	1884	21.2	1884	33.8	1884
New Haven, Conn	—14	1873	—4	1881	0.8	1884	16	1874	30.5	1882
New London, Conn	—10	1882	—6	1871	4	1884	19	1874	32	1876, 1882
Middle Atlantic States:										
Albany, N. Y	—18	1873	—18	1875	—4	1875	13	1874	29	1874, 1876
New York City	—6	1875	—4	1873	3	1872	20	1874	34	1876, 1880
Philadelphia, Pa	—5	1875	—1	1875, 1881	5	1872	17.5	1874	36	1880
Atlantic City, N. J	—3	1875	—5	1875	8	1884	19	1875	33	1876, 1880
Barnegat City, N. J	—10	1875	—4	1881	10	1875	19	1875	34	1876, 1880
Cape May, N. J	1	1879	2	1875	9	1872	24	1875	34	1882
Little Egg Harbor, N. J	8	1883	12	1883	10.8	1884	28.4	1882	34.5	1882
Sandy Hook, N. J	—3	1879	Zero.	1881	6.9	1884	12	1874	33	1874
Delaware Breakwater, Del	9	1884	7	1881	15.8	1884	25	1881	40	1880
Baltimore, Md	—6	1881	2	1873	5	1873	23.5	1875	34	1876
Ocean City, Md	4	1884	14.8	1884	13.8	1884	27.2	1884	40	1883
Washington City	—14	1881	—1.5	1875	4	1873	22.5	1875	33.5	1876
Cape Henry, Va	9	1879	11	1875	12	1883	28	1875	41	1876
Chincoteague, Va	8	1882, 1884	5	1881	15	1884	26	1881	40	1880
Lynchburg, Va	—4	1877	3	1875	16	1884	25	1881	37	1876
Norfolk, Va	8	1879	9	1875	16	1872	27	1875, 1880	38	1876
South Atlantic States:										
Charlotte, N. C	5	1884	17.8	1884	23	1884	28	1881	40.5	1883
Hatteras, N. C	15	1884	20	1881	26	1884	31	1881	47	1882
Kitty Hawk, N. C	8.6	1884	11	1881	20	1876	29	1881	42	1876, 1877
Macon, Fort, N. C	8.5	1884	20	1881	25.6	1884	30	1881	48	1882
New River Inlet, N. C	4	1884	23	1884	23.1	1884	37	1883	46	1883
Scott's Hill, N. C	4.9	1884	24.5	1884	20	1884	32	1884	45	1883
Smithville, N. C	6	1884	18	1881	21	1876	29	1881	41	1878
Wilmington, N. C	9	1884	15	1875	20	1873	28	1875	38	1876

APPENDIX 15.

Signal Service, United States Army, for each month and the year. (*Compiled from the com-*
to and including December, 1884.)

ing thermometers.]

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
30	1875	45	1882, 1884	45	1880	35	1875	24	1881	—18	1875	—21	1884	—21	1884
42	1875	51	1876, 1882	48	1874	37	1875	28	1876, 1879	— 6	1875	—17	1872	—17	1872
15	1878, 1879	27	1883	20	1876	11	1879	— 8	1881	—40	1875	—47	1876	—49	1872
42	1884	46	1874	47	1880	34	1879	25	1879	— 2	1875	—12	1883	—18	1882
40.1	1881	50	1879	45.5	1883	39.5	1883	28	1879	9	1880	— 7.2	1884	— 8	1882
40.2	1884	55	1883	54.5	1884	41.5	1883	32.6	1884	19	1880	— 8.2	1884	— 4	1882
41	1884	42	1884	45	1883	39	1883	28	1884	15	1882	— 9	1883, 1884	— 9	1883, 1884
42	1884	52	1883	49	1883, 1884	41	1883	29	1884	15	1882	— 8	1883, 1884	— 8	1883, 1884
41.4	1884	51	1879	45.7	1884	35	1879	24	1879	2	1875	— 9.5	1884	—14	1873
43	1876, 1884	51	1879	47.5	1884	37	1879	27.2	1883	4	1875	— 7.5	1883	—10	1882
40	1875, 1878	48	1876	45	1875	33	1875, 1879	23	1876	—10	1875	—17	1875	—18	1875, 1878
47	1878, 1879	57	1873, 1882	53	1874	36	1872	31	1876	7	1875	— 6	1880	— 6	1875, 1880
47.2	1884	56	1883	53	1872	43	1879	31	1873, 1876	8	1875	— 5	1880	— 5	1875, 1880
45	1878	58	1880	58	1879	43	1875	29	1879	10	1875	— 7	1880	— 7	1880
47	1878	53	1879	53	1879	41	1875	28	1876	11	1875	— 7	1880	—10	1875
47	1876	56	1880	55	1882	42	1871, 1875	31	1878	14	1876	2	1880	1	1879
46	1884	51.2	1882	55	1883	47.2	1883	30.1	1884	21.8	1884	— 2	1884	— 2	1884
40	1874	50	1880	55	1874	46	1875	33	1876	8	1875	— 5	1880	— 5	1880
50	1881	59	1882	60	1881	51	1882	34.5	1884	23	1880	1	1880	1	1880
40	1873	59	1876, 1882	52	1874	40	1873, 1879	30	1873, 1876, 1879	15	1880	— 3	1880	— 6	1881
55	1883	54.1	1884	57	1883	45	1882	32.2	1884	22	1883	8	1884	4	1884
46.5	1873	56.1	1884	50	1874	38	1879	26	1873	12.5	1880	—13	1880	—14	1881
51.4	1884	60	1881	60	1874, 1879, 1881	53	1880	39	1875, 1880	24	1880	7	1880	7	1880
50.1	1884	59	1882	60	1880, 1881	46	1882	36.5	1884	18	1880	1	1880	1	1880
40	1880	55	1876, 1882	50	1874	40	1875, 1879	28	1879	18	1880	— 5	1880	— 5	1880
53	1876, 1884	60	1876, 1877	58	1874	50.5	1875	31	1876	20	1872	6	1880	6	1880
51.5	1884	60	1882	56	1879	43	1879	30	1879	18	1880	— 5	1880	— 5	1880
56.5	1884	63	1881	64	1881	60	1882	47	1884	32	1881	8	1880	8	1880
52	1884	61.5	1884	62	1879, 1881, 1882	53	1876	38	1876	23	1879	8	1880	8	1880
55.1	1884	65	1881, 1882	63	1881, 1883	58	1882	43.8	1884	28	1881	15.2	1884	8.5	1884
48.2	1884	63.4	1884	60.9	1884	58	1883	36.4	1884	24	1883	12	1884	4	1884
47	1884	60.1	1884	60	1883	50	1882	30.5	1884	24	1883	11	1884	4.9	1884
50.6	1884	61	1881	58	1883	49	1879, 1880	35	1876	23	1879, 1881	10	1880	6	1884
51	1884	62	1881	56	1874	47	1879	32	1876	20	1872	10	1880	9	1884

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
South Atlantic States—Continued:										
Charleston, S. C	18	1884	26	1881	28	1876	32	1881	47	1876
Augusta, Ga	14	1884	22	1875	22	1873	31	1881	42	1877
Savannah, Ga	18	1873	26	1884	27	1873	33	1881	48	1877
Jacksonville, Fla	21	1884	32	1875, 1878	31	1873, 1876	37	1881	48	1877
Florida Peninsula:										
Cedar Keys, Fla	25.2	1884	35	1881	40	1881	38	1881	50	1883
Key West, Fla	48	1879	55	1872, 1877, 1878	53	1873	61	1873, 1881	63	1877
Sanford, Fla	28.5	1884	40.4	1884	43	1884	49	1884	51	1883
Eastern Gulf States:										
Atlanta, Ga	−1.3	1884	11	1884	24.5	1884	25	1881	39.5	1883
Pensacola, Fla	16.3	1884	29	1884	36	1881	34	1881	46.6	1883
Mobile, Ala	13.9	1884	28	1875, 1876	31	1873, 1876	32	1881	47.3	1883
Montgomery, Ala	8	1884	22	1875, 1884	25	1873	30	1881	44	1883
Vicksburg, Miss	10	1875	21	1875	27	1876	31	1881	46	1877
New Orleans, La	20	1879	32.5	1875	36.5	1876	38	1881	56	1871, 1877
Western Gulf States:										
Shreveport, La	6	1879	19.1	1884	26	1876	32	1881	47	1876, 1877
Fort Smith, Ark	−5	1884	8	1883	23.5	1884	35.3	1884	45	1883
Little Rock, Ark	5.5	1884	17	1884	28	1884	29	1881	44	1883
Galveston, Tex	20	1883	28.5	1884	34	1875	44	1873	54	1876
Indianola, Tex	15	1873	21.5	1883	32	1880	32	1875	51	1872
Palestine, Tex	6.5	1884	13.5	1883	31.8	1884	33.4	1884	50	1883
Rio Grande Valley:										
Brownsville, Tex	18	1881	27	1883	35	1880	43	1881	49	1877
Rio Grande City, Tex	19	1881	32	1880	32	1884	43	1881	49	1877
Ohio Valley and Tennessee:										
Chattanooga, Tenn	−1	1884	11	1884	22.8	1884	25	1881	41	1879
Knoxville, Tenn	−16	1884	6	1873	6	1873	24	1875, 1881	37	1880
Memphis, Tenn	−2	1884	18	1875	18	1876	27	1881	41	1883
Nashville, Tenn	−10.2	1884	9	1875, 1876	11	1873	25.5	1875	37	1877
Louisville, Ky	−19.5	1884	Zero.	1875	8	1873	21	1875	36	1875, 1876
Indianapolis, Ind	−25	1884	−8	1875	5	1884	19	1875	31	1877
Cincinnati, Ohio	−10	1879	−1	1875	1	1873	18	1875	35	1883
Columbus, Ohio	−20.3	1884	−2	1881	6	1884	15	1881	34	1883
Pittsburg, Pa	−12	1875	−10	1875	2	1877	14	1875	27	1876
Lower Lakes:										
Buffalo, N. Y	−13.5	1884	−13	1875	−2	1884	11	1881	29	1876
Oswego, N. Y	−13	1882	−10	1875	−11	1872	13	1874	31	1876
Rochester, N. Y	−12	1873	−12	1875	−7	1872	11	1879	28	1880
Erie, Pa	−15	1875	−16	1875	−1	1884	11	1881	32	1875, 1877, 1882, 1883
Cleveland, Ohio	−17	1873	−11.2	1875	−2	1873	15	1875	28.3	1876

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
56.2	1884	67	1876, 1881, 1882	62	1879	54	1879	39	1878	28	1878, 1881	13	1880	13	1880, 1884
57	1882	62	1876	61	1874	48	1876	29	1878	24	1878	7	1880	7	1880
56.5	1884	66	1876	63	1879	54	1871	37	1873	22	1872	15	1880	15	1880
61.7	1884	68	1877, 1879	66	1874, 1875	56	1874	40	1878	30	1878	19	1880	19	1880
62	1884	69	1881	69	1881	64	1880	49	1880	33	1881	22	1880	22	1880
71.2	1883	72.7	1883	72	1882, 1884	71.5	1883	65	1873, 1876	52	1878	44	1876	44	1876
62.6	1884	69.8	1884	69	1883	64	1884	55.5	1884	44.4	1884	36	1883	28.5	1884
54	1879	57.8	1882	57	1879	44	1879	33.6	1884	20	1881	1	1880	— 1.3	1884
64	1881	64.2	1882	66.4	1884	57.3	1882	45	1880	28.1	1881	17	1880	16.3	1884
61	1879	63.8	1882	63	1884	53	1871	34	1878	27	1872, 1877, 1881	14	1880	13.0	1884
58	1877, 1879	60.8	1882	61.5	1879	51.5	1876	33	1878	21	1872	8	1880	8	1880, 1884
53	1879	62	1881	62	1879	48	1871	34	1873	23	1877, 1880	12	1880	10	1875
65	1879	69.8	1882	65.5	1884	58	1871	40	1873	31.5	1881	20	1870, 1880	20	1870, 1879, 1880
55	1877	64	1877, 1880, 1882	58	1880	47	1881	31	1873	18	1880	10	1880	6	1879
50	1882	61	1882	58.4	1884	39.6	1883	39	1884	22	1882	9.5	1882	— 5	1884
55	1882	61	1882	59.2	1884	47	1881	39	1880	10	1880	6	1880	5.5	1884
64	1877, 1879	69	1880	70	1877, 1880, 1882	59	1875	45	1873	29	1880	18	1880	18	1880
60	1877	68	1877	67	1880	60	1878	46	1873, 1880	22	1880	14	1880	14	1880
55	1882	63	1882	62	1884	49	1883	41	1883	26.5	1882	15.2	1884	6.5	1884
60	1877	68	1877	68	1884	57	1883	49	1879	30	1880	18	1880	18	1880, 1881
62	1877	62	1877	65.7	1884	53	1883	43	1878, 1879	30	1880	24	1880	19	1881
51	1879	57.5	1882	57	1879	47	1879, 1880	34	1884	17	1883	3	1880	— 1	1884
47	1878	53	1882	50	1879	40	1871	25	1876	11.5	1872	— 5	1880	—16	1884
54	1879	60	1882	59	1880	44	1875	29	1878	16	1877, 1880	3	1876, 1880	— 2	1884
49	1877	56.3	1882	54.7	1883	41	1875	28	1873	18	1872	— 2	1876	—10.2	1884
49	1875	57	1882	56	1880	42	1875, 1876	27	1878	4.5	1872	— 7	1880	—19.5	1884
45	1877, 1882	53	1882	48	1876	35	1875	23	1878	— 5	1880	—15	1876	—25	1884
49	1877	58.2	1882	55	1872, 1875	41	1875	27	1878	5	1880	— 8	1872	—10	1879
48	1879, 1882, 1883	54	1882, 1883	50	1883	37	1879	25	1879	— 5	1880	—12	1880	—20.3	1884
39	1879	52	1874	49	1876	35	1879	28	1873, 1876, 1878	4	1880	— 9	1880	—12	1875
40.5	1879	47.5	1876	44	1880	35	1878	24.7	1884	2.5	1875	— 9	1880	—13.5	1884
40.5	1875	49	1875	44.4	1884	36	1879	25.6	1884	— 1	1875	—17.5	1884	—17.5	1884
36	1879	48	1873, 1884	42.8	1884	34	1878, 1879	19	1879	1	1875	—11	1871	—12	1873, 1875
42	1879	52	1883	50	1883	40	1879	28	1876	6	1880	—11	1880	—16	1875
49	1879	49.6	1883	45.6	1876	38	1875	26	1876	Zero.	1880	—12	1872, 1880	—17	1873

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Lower Lakes—Continued:										
Sandusky, Ohio	—16.5	1879	— 2.8	1884	6	1884	14	1881	24	1880
Toledo, Ohio	—14	1873, 1884	—12	1875	— 8	1873	12	1875	30	1876
Detroit, Mich	—15	1875, 1879	—20	1875	— 7	1872	8	1875	29	1875
Upper Lakes:										
Alpena, Mich	—27	1882	—27	1881	—19	1884	— 2	1881	22	1883
Escanaba, Mich	—26	1881	—32	1875	—26.8	1884	2	1883	20	1882
Grand Haven, Mich	—12	1873	—24	1875	Zero.	1873, 1875	9	1874	28	1875
Mackinaw City, Mich	—15.9	1884	—16.6	1884	—20.2	1884	8	1883	28	1883
Marquette, Mich	—26	1881	—27	1875	—16	1884	8	1875	22	1875
Port Huron, Mich	—14.7	1883	—20	1875	— 8	1875	7	1875	26.2	1883
Chicago, Ill	—20	1875	—13	1875	—12	1873	17	1875, 1879, 1881	27	1875
Milwaukee, Wis	—25	1875	—22	1875	— 8.5	1884	12	1875	25	1875
Duluth, Minn	—38	1875	—34	1875	—26	1875	8	1874, 1881	26	1876
Upper Mississippi Valley:										
Saint Paul, Minn	—31.5	1884	—32	1875	—22.5	1873	7	1874	24	1875
La Crosse, Wis	—43	1873	—34	1875	—23	1873	10	1881	29	1875
Davenport, Iowa	—27	1884	—16	1875	— 8	1884	16	1881	29	1875
Des Moines, Iowa	—30.4	1884	—23	1883	— 5.6	1884	11	1881	33	1883
Dubuque, Iowa	—26.2	1883	—31	1875	—10	1875	14	1875	27	1875
Keokuk, Iowa	—24.2	1884	—11	1873	— 2	1873	20	1875, 1879, 1881	29	1875
Cairo, Ill	—16	1884	4	1875	10	1873	24	1875	37	1875
Springfield, Ill	—22.3	1884	— 2.4	1883	7	1884	19	1881	33.9	1883
Saint Louis, Mo	—21.5	1884	— 3	1875	8	1873, 1876	22	1875	32	1875
Missouri Valley:										
Leavenworth, Kans	—29	1873	—12	1883	2	1876	13	1881	31	1875
Omaha, Nebr	—32	1884	—24.9	1883	— 7	1880	6	1881	28	1875
Bennett, Fort, Dak	—42	1883	—34	1881	—11	1881, 1884	4	1881	30	1883
Huron, Dak	—38	1884	—31.8	1883	—14.6	1884	19.2	1882	28	1883
Sully, Fort, Dak	—39	1883	—30	1875, 1883	—22	1876	11	1875	15	1882
Yankton, Dak	—32	1831	—23.1	1884	—16	1876, 1880	— 3	1881	24	1875
Extreme Northwest:										
Moorhead, Minn	—43	1884	—33	1881, 1883	—23	1884	—13	1881	26	1882
Saint Vincent, Minn	—44	1881, 1883	—38	1883	—31	1883	—14	1881	21	1882
Bismarck, Dak	—40	1884	—31	1875	—25	1875	1	1881	21	1875
Buford, Fort, Dak	—46	1883	—40	1883, 1884	—23	1880	7	1880	22	1882, 1883
Northern Slope:										
Assinaboine, Fort, Mont	—43	1883	—47	1883	—25.8	1884	7	1881	20	1881
Benton, Fort, Mont	—55	1875	—41	1883	—42	1876	— 6	1875	26	1883
Custer, Fort, Mont	—31	1881	—38	1883	—23	1880	12	1883	23	1883
Helena, Mont	—34	1883	—32	1883	— 9	1884	6	1881	25	1883
Maginnis, Fort	—29	1883	—35	1883	—14.1	1884	14	1883	19	1883

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
47	1879, 1882	56	1880	48.5	1882	42	1879	30	1878, 1880, 1884	Zero.	1880	—13	1880	—16.5	1879
43	1873, 1875, 1878, 1879	50	1883	47	1879	36	1871	25	1876	5	1880	—15	1872	—15	1872
38	1875	50	1873, 1883	45	1875	29.8	1883	22	1873	Zero.	1880	—24	1872	—24	1872
33.5	1881	45	1876, 1882, 1883, 1884	39	1884	29.3	1883	20.9	1884	— 4	1880	—15	1880	—27	1881, 1882
34	1875, 1879	42	1875	38	1875	26	1883	17	1878	— 9	1880	—23	1880	—32	1875
40	1878, 1879	40	1873	42.5	1875	30	1879	26	1876	Zero.	1880	—12	1884	—24	1875
35.7	1883	46.8	1883	41.8	1884	34	1883	24	1883	8.4	1883	— 5	1884	—20.2	1884
31	1881	40.3	1883	34.7	1883	28	1883	18	1878	— 9	1875	—20	1880	—27	1875
37	1877	46.5	1884	46	1875, 1879	31	1879	23.8	1884	— 6	1880	—14	1880	—20	1875
40	1875	50	1873	51.1	1884	37	1872, 1876	25	1873	— 2	1872	—23	1872	—23	1872
40	1875, 1879, 1882	50	1875, 1876, 1880, 1883	42	1875	32	1876	22	1878	— 5	1880	—21.6	1884	—25	1875
38	1875, 1876	46	1875	45	1876	30	1879, 1883	8	1878	—29	1875	—34	1879	—38	1875
39	1876, 1877	46	1873	43	1875	30	1873	15	1878	—24.5	1875	—30	1879	—39	1879
40	1876	52	1880, 1883	44	1875	31	1873	18	1873	—21	1875	—37	1872	—43	1873
43	1876, 1882	50	1884	44.5	1884	36	1879	18	1873	— 3	1875	—17	1872, 1876	—27	1884
44	1882	52	1882	48	1879, 1883	34	1879	15	1878	Zero.	1880	—18.2	1884	—30.4	1884
40	1877	50.4	1882	41	1875	33	1873	20	1873	— 9	1875	—19	1876, 1879, 1880	—31	1875
45	1877	56	1873, 1880, 1883	47	1875	39	1875, 1876, 1883	20	1873	— 3	1872	—22	1872	—24.2	1884
50	1877	60	1883	57	1880	42	1876	24	1873	7	1872	— 7	1872	—16	1884
48.7	1882	54	1883	48.9	1884	38	1879	26	1880	6	1880	—14	1880	—22.3	1884
48	1877	57	1876	54	1884	40	1875	25	1873	5	1872	—17	1872	—21.5	1884
45	1877, 1882	53.5	1883	50	1884	37	1876	19	1873	Zero.	1872	—14	1880	—29	1873
42	1877	51	1873	49	1877	30	1873	15	1878	— 6	1875	—17	1879, 1884	—32	1884
33	1882	46	1882	42	1883	27	1883	10	1880	—18	1880	—41.3	1884	—42	1883
34	1883	46	1883	42.7	1883	28.2	1883	21	1881	—12.8	1884	—34.2	1884	—38	1884
37	1875	48	1877, 1882	41	1884	18	1881	9	1874	—18	1875	—30.5	1884	—39	1883
38	1876, 1877, 1879	44	1877	45	1875	26	1876	9	1878	—15	1875	—34	1879	—34	1879
33	1883	43	1883, 1884	38	1882	17	1883	14.9	1884	—15	1881, 1884	—34	1883	—43	1884
29	1883	40	1881, 1883	36	1881	17	1883	10.2	1884	—22	1880	—47.8	1884	—47.8	1884
32	1875	32	1884	39	1875	10	1876	6	1874, 1878	—28	1875	—38	1879	—40	1884
30	1883	37.5	1884	36	1883	18	1883	9	1881	—20	1881	—46	1879	—46	1879, 1883
31	1883	35	1881	37	1881	25	1884	—16	1881	—25	1880	—50	1884	—50	1884
27	1881	37	1874	34	1881	14	1873	— 6	1881	—31	1875	—59	1880	—59	1880
30	1883	41	1883	36	1883	29	1880	10	1879	—24	1880	—47.5	1884	—47.5	1884
31	1880	38	1880	34	1880	30	1880, 1882	10	1881	—17	1880, 1881	—40	1880	—40	1880
33	1883	37	1884	30	1883	25.7	1884	14	1883	—16	1883	—30	1884	—35	1883

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Northern Slope—Continued:										
Shaw, Fort, Mont	—33	1883	—37	1883	—22.5	1884	— 4	1880	21	1881
Deadwood, Dak	—30	1883	—32	1883	— 7.2	1884	11	1880, 1881	21	1883
Cheyenne, Wyo	—38	1875	—28.2	1884	—17	1880	2	1875	22	1884
North Platte, Nebr	—27	1881	—29	1883	—21	1880	12	1875	30	1875
Middle Slope:										
Denver, Colo	—29	1875	—22	1883	—10	1880	4	1876	27	1872, 1873
Pike's Peak, Colo	—37	1883	—37	1875	—29	1875	—21	1875	— 8	1875
West Las Animas, Colo	—21.5	1883	—22.7	1884	6	1882	18	1882	27.5	1884
Dodge City, Kans	—20	1883	—20	1883	— 8	1880	13	1881	32	1884
Reno, Fort, Ind. T	— 4	1884	— 2	1884	14	1883	31	1884	37	1884
Elliott, Fort, Tex	—12	1883	—10	1883	— 2	1880	20	1881	36	1884
Southern Slope:										
Sill, Fort, Ind. T	— 9	1879	— 3.5	1883	10	1880	26	1881	42.5	1883
Concho, Fort, Tex	— 1	1881	6	1883	16	1880	29	1882	46	1878
Davis, Fort, Tex	Zero.	1881	9	1883	17	1880	25	1882	40	1880, 1884
Stockton, Fort, Tex	2	1881	8	1883	15	1880	24.2	1882	41.5	1882
Southern Plateau:										
Santa Fé, N. Mex	—13	1883	— 8	1879, 1880	Zero.	1880	11	1875	24	1880
El Paso, Tex	5	1881	12	1881	21	1880	29	1882	39.5	1884
Apache, Fort, Ariz	— 6	1883	— 9	1880	11	1881	15	1883	29	1880, 1883
Grant, Fort, Ariz	10	1883	17	1883	21	1882	29	1879	37	1882
Phœnix, Ariz	13.2	1883	19.1	1884	28	1881	30.1	1883	36.8	1884
Prescott, Ariz	—17	1880	—11	1880	— 8	1876	13	1878	26	1877
San Carlos Agency, Ariz	16	1882	21	1882	22	1882	30	1882	38	1884
Thomas, Camp, Ariz	10	1884	16	1881	23	1881	24.3	1883	36.9	1884
Verde, Fort, Ariz	1.4	1883	10	1880	11	1881	27	1883	37	1880
Wickenburg, Ariz	18	1881	10.8	1882	20	1880	30	1878, 1880	38	1880
Yuma, Ariz	22.5	1883	25	1880	31	1881	40	1878	48.9	1884
Middle Plateau:										
Winnemucca, Nev	—23	1883	—19.5	1883	— 3	1882	17	1883	20	1879
Salt Lake City, Utah	—20	1883	—13	1884	4	1874	19	1875	32	1880
Northern Plateau:										
Boisé City, Idaho	—27	1883	—12	1883	9	1882	17.5	1883	29	1878
Cœur d'Alene, Fort, Idaho	—29	1883	—21	1883	Zero.	1884	20	1882	23	1884
Lewiston, Idaho	—14.2	1883	17.8	1884	12	1880	30	1880	35	1881
Dayton, Wash	—23.5	1883	—24	1883	8	1880	21	1880	30	1881
Spokane Falls, Wash	—27.7	1883	—15.1	1883	7	1882	26	1881	29	1881
North Pacific Coast:										
Canby, Fort, Wash	32.3	1884	16	1884	33.5	1884	40.9	1884	42.6	1884
Olympia, Wash	0	1883	2	1884	23	1880	28	1880	30	1882
Portland, Oreg	3	1875	7	1883	25.5	1880	28	1875	33	1878
Roseburg, Oreg	12	1883	3.3	1884	19	1880	29	1878	33	1880
Middle Pacific Coast:										
Cape Mendocino, Cal	31	1883	28.5	1884	36	1884	36	1883	38	1883
Red Bluff, Cal	19	1883	22	1884	28	1880	34.9	1882	37	1879
Sacramento, Cal	22	1883	21	1884	29	1880	39.8	1883	39	1880

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
36	1883	37	1882	33	1883	21	1884	— 2	1881	—26.5	1880	—44.5	1884	—44.5	1884
33	1880	42	1880, 1883	40	1882	28	1884	5	1880	—16	1880	—28	1884	—32	1883
28	1876	37.6	1882	34	1876	23	1878	— 4	1878	—20	1875	—24	1879, 1880	—38	1875
33	1876	45	1877, 1882	42	1876	21	1876	11	1878	—10	1877	—27	1879	—29	1883
37	1883	42	1873	44	1876	28	1873	1	1873	—18	1877	—25	1876	—29	1875
2	1882	15	1876	15	1882	6	1876	—17	1878	—30	1880	—37	1878	—37	1875, 1878, 1883
40.5	1883	52	1882	49.5	1882	35	1883	19	1883	— 1	1882	—21.5	1884	—22.7	1884
40	1879	50	1877	50	1880	30	1876	10	1878	— 7	1880	—15	1876	—20	1883
53	1883	57	1883	52	1884	40	1883	28	1883	17	1883	— 2.5	1884	— 4	1884
44	1880, 1882	49	1880	48	1880, 1882	37	1880	26	1880	— 5	1880	—10	1879	—12	1883
47	1879	56	1877, 1880	53	1880	44	1878	25	1878	— 4	1880	2	1879, 1880, 1884	— 9	1879
49	1879	60	1877, 1880	54	1880	45	1882	32	1878	12	1880	6	1880	— 1	1881
49	1881	53	1881	47	1882	37	1883	30	1880	6	1880	1	1880	Zero.	1881
46	1877	50	1877	51	1882	40	1883	29	1877	12	1880	8	1880	2	1881
33	1877, 1880	46	1872, 1880	40	1882	27	1880	16	1880	—11	1880	—13	1879	—13	1879, 1883
50	1881	56	1880	52	1880	42	1880	28	1882	11	1880	— 5	1880	— 5	1880
36	1880, 1882	41	1879	41	1880	32	1880, 1882	19	1880	9	1880	— 8	1884	— 9	1880
51	1882	56	1880	55	1882	47	1881	33	1881	20	1880	18	1880	10	1883
43	1879	62	1879, 1880	52.3	1884	39.1	1884	33.6	1883	24	1880	18	1879	13.2	1883
32	1880	42	1879	38	1876	29	1881	18	1880	— 1	1880	—18	1879	—18	1879
43	1883	54	1883	55	1884	42	1882	29	1881, 1882	17	1881	18	1881	16	1882
45	1880	52	1880	49	1880	42.9	1884	26	1880	16	1880	17	1884	10	1884
42	1884	48	1879	49	1884	34	1881	27.3	1881	8	1880	6	1879	1.4	1883
45.5	1884	40	1878	49.5	1884	41	1884	23	1877	19	1880	12	1878	10.8	1882
56	1878	61	1879	64	1879	50	1882	41.4	1883	31	1880	27	1879	22.5	1883
29	1880	37	1877, 1878	32	1880	22	1880, 1881	10	1878	— 9	1880	—20	1879	—23	1883
37	1875	45	1880	44	1880	36	1881	22	1878	3	1880	—10	1879	—20	1883
36	1882	40	1883	39	1881	30	1881, 1882	19	1878	7	1880	— 7.3	1884	—27	1883
36	1883	29	1884	37	1882	30	1882	17	1881	Zero.	1881	—21	1884	—29	1883
43	1880	48	1880, 1881, 1882	45	1882	34	1883	28	1881	13	1880	—16	1879, 1884	—17.8	1884
35.5	1883	37.4	1881	36	1883	29	1881	19	1881	5	1881	—26	1884	—26	1884
39	1882	42.8	1884	38	1881, 1882	31	1881	18	1881	3	1881	—17.8	1884	—27.7	1883
47.6	1884	51	1884	50.6	1884	42.5	1884	40.2	1883	33.5	1883	21	1884	16	1884
36	1880	40	1882	41	1880, 1882	31	1877	23	1881	21	1882	8	1879, 1884	2	1884
39	1875	46	1875, 1880	43	1876	39	1873, 1877, 1882	31	1877	22.5	1880	3	1879	3	1875, 1879
37.5	1880	40	1879	40.5	1882	34.6	1881	22.5	1881	17.5	1880	7	1879	3.3	1884
43	1883	45	1882	46	1883	45	1882, 1884	42	1882	38	1882, 1883	34	1884	28.5	1884
47	1880	53	1881	52	1881	46.5	1884	32	1881	26	1880	25	1878, 1879, 1882, 1883, 1884	19	1883
48	1881	51	1879	49	1880	44.4	1882	36.4	1881	27	1880	23.5	1878	21	1884

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Middle Pacific Coast—Continued:										
San Francisco, Cal	36	1876	35	1883, 1884	39	1880	40	1875	45	1876, 1879, 1880, 1882
South Pacific Coast:										
Los Angeles, Cal	30	1880, 1883	28	1883	35.8	1882	39	1883	39.5	1883
San Diego, Cal	32	1880	35	1880	38	1880	39	1875	45.4	1883
Alaska stations:										
Alexander, Fort, Alaska	—18	1882	—26	1882	— 6	1882	8	1882	23	1882
Atka, Alaska	20	1882, 1883, 1884	19	1882	15	1883	21	1884	24	1882
Hoochnahoo, Alaska	8	1882	Zero.	1882	Zero.	1822	22	1884	29	1882
Pyramid Harbor, Alaska	—13	1882	—13	1882	—13	1882	14	1882	30	1882
Saint Michael's, Fort, Alaska	—47	1878	—52	1878	—39	1878	—27	1880	— 2	1876, 1879
Sitka, Alaska	8.5	1882	4	1882	5.5	1882	25.5	1882	31	1881
Unalashka, Alaska	16	1884	7	1879	5	1883	15	1884	24	1882
Behring's Island, Behring Sea	6.8	1884	9.5	1884	12.2	1884	0.6	1884	27.4	1884

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
48	1871, 1873, 1874	49	1874, 1881	50	1875, 1879, 1882	50	1874, 1880, 1881, 1882	45	1881	41	1880	34	1879	34	1879
47	1878	51.2	1881	50	1883	44	1880	42.5	1879	34.2	1881	30	1878, 1879	28	1883
50	1884	53.7	1884	54	1879, 1884	49.5	1882	44	1878	38	1881	32	1879	32	1879, 1880
33	1884	36	1884	30	1884	21	1884	9	1882	— 5	1884	—29	1881	—29	1881
30	1879	35	1883	39	1883, 1884	34	1884	28	1882	22	1882, 1883	12	1881	12	1881
35	1882	40	1882, 1883	33	1884	30	1882	25	1883	15	1883	1	1882	Zero.	1882
37	1882	43	1883	39	1882	32	1882, 1883	21	1882	9	1881	— 9	1882	—13	1882
22	1881	33	1881	31.5	1884	18	1884	3	1879, 1880	—24	1876	—43	1880	—52	1878
38	1882, 1883	43	1881, 1882	42.5	1883	32	1884	26	1883, 1884	5	1883	9	1882	4	1882
34	1883	37	1881	36	1882	33	1883	24	1879	19	1883	12	1882	5	1883
31.3	1882	36.1	1883	33.2	1884	30.4	1884	19.2	1882	13.4	1884	1.4	1882	0.6	1884

APPENDIX 16.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1884.

[The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Accotink, Va	31.8	43.3	44.9	53.6	66.4	75.1	76.5	76.3	72.6	61.1	45.1	38.9	57.1
Aiken, S. C	40.8	55.8	58.1	60.7	75.7	(1)	(1)	(1)	(1)	(1)	53.7	48.6	.....
Albany, Oreg	38.9	37.0	45.0	52.7	59.7	61.5	63.3	68.2	53.3	52.5	47.4	32.1	50.9
Allison, Kans	20.4	20.8	35.3	44.5	57.1	71.0	74.3	68.0	66.5	54.0	34.5	16.9	46.9
Altoona, Pa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	71.1	57.4	44.4	33.6	.....
Amherst, Mass	21.6	30.5	31.0	45.5	56.6	68.7	67.9	69.2	64.4	50.3	38.7	33.2	48.1
Andersonville, Ga	41.7	(1)	60.0	64.0	74.4	(1)	79.3	81.7	77.1	49.5	(1)	(1)	.....
Anna, Ill	25.6	38.7	45.7	54.7	65.5	73.7	77.7	75.2	74.6	64.6	47.4	32.5	56.3
Ann Arbor, Mich	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	65.4	(1)	34.4	(1)	.....
Archer, Fla	52.0	65.6	68.2	69.0	80.3	79.1	81.9	79.5	77.7	73.9	62.0	63.1	71.1
Ardenia (Phillipstown), N. Y	(1)	(1)	(1)	(1)	(1)	73.5	(1)	66.5	62.4	(1)	(1)	(1)	.....
Asheville, N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	46.0	41.0	.....
Ashwood, Tenn	29.0	46.4	50.5	58.0	70.0	76.0	79.5	78.0	72.0	61.0	48.0	32.5	58.4
Atchison, Kans	(1)	25.0	39.8	50.2	62.5	71.0	76.4	72.1	72.0	58.7	40.6	22.2	.....
Athens, Ga	(1)	(1)	(1)	57.4	72.4	70.6	78.5	75.2	74.8	67.1	49.1	44.8	.....
Auburn, N. Y	17.5	28.0	30.0	43.3	58.5	69.0	66.5	68.2	64.5	51.6	38.7	30.7	47.2
Austin, Tenn	28.2	47.0	49.0	55.7	68.6	(1)	77.6	78.8	75.8	65.7	46.1	41.5	.....
Austin, Tex	(1)	(1)	(1)	(1)	73.9	82.7	83.3	84.8	83.2	70.8	58.0	49.5	.....
Bainbridge Island, Wash	39.0	34.0	43.0	51.3	52.0	60.0	62.2	(1)	54.0	61.1	47.2	(1)	.....
Beloit, Wis	10.2	20.1	29.4	44.7	57.9	66.5	68.5	66.5	66.4	52.0	32.2	18.7	44.4
Blooming Grove, Pa	20.9	(1)	(1)	(1)	57.6	72.1	74.8	71.2	71.3	(1)	38.9	29.8	.....
Blue Lake, Cal	(1)	(1)	(1)	(1)	(1)	60.3	61.7	69.7	55.6	55.0	50.9	41.1	.....
Bowling Green, Ky	26.4	(1)	44.8	(1)	(1)	(1)	74.6	(1)	(1)	(1)	42.7	(1)	.....
Boyne, Mich	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	33.5	23.6	.....
Brevard, N. C	34.9	46.5	48.6	58.5	65.0	68.1	(1)	70.5	68.0	59.9	43.3	42.9	.....
Bunker Hill, Ill	18.8	31.0	39.8	50.6	61.9	70.9	78.8	70.1	71.4	57.2	(1)	21.7	.....
Burlington, Vt	13.5	25.0	29.9	43.8	55.8	70.7	(1)	(1)	65.2	48.7	36.1	26.8	.....
Carson City, Nev	30.2	26.0	38.8	46.1	57.5	61.2	69.6	68.0	55.8	48.6	38.7	35.6	48.0
Carthage, Mo	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	62.1	49.0	30.0	.....
Catawissa, Pa	21.2	30.8	32.2	50.0	62.0	66.5	71.8	69.0	67.2	55.0	40.8	31.8	49.8
Cedar Rapids (W.), Iowa	8.9	17.6	29.4	43.5	57.7	67.8	(1)	(1)	(1)	(1)	(1)	20.1	.....
Chambersburg, Pa	23.1	32.8	38.9	47.4	58.6	(1)	70.1	69.7	66.6	53.5	36.1	31.5	.....
Chapel Hill, N. C	36.0	49.6	51.4	56.5	69.2	72.5	76.7	75.6	73.2	65.2	50.9	43.2	60.0
Charlotte, Vt	11.0	22.5	26.5	42.5	56.8	68.0	67.9	62.5	69.0	48.2	34.8	23.8	44.5
Cincinnati (G. W. H.), Ohio	27.0	39.0	43.6	52.4	67.4	75.0	75.8	74.9	73.6	61.0	43.7	34.6	55.7
Clarksville, Tex	34.9	47.4	56.8	60.5	69.0	76.8	85.7	80.4	80.1	67.3	54.4	41.8	62.9
Clay Centre, Kans	21.3	24.9	(1)	(1)	(1)	73.6	78.8	71.8	72.5	58.9	40.5	21.5	.....
Cleburne, Tex	(1)	47.0	57.2	60.0	68.3	75.2	84.2	85.0	81.1	65.7	51.1	38.2	.....
Cleveland, Ohio	20.1	30.7	34.4	44.6	58.5	69.0	68.9	67.9	(1)	55.1	39.3	30.9	.....
Clinton, Ind	(1)	(1)	(1)	(1)	60.4	74.4	73.0	70.0	(1)	(1)	(1)	(1)	.....
College City, Cal	47.2	48.9	55.0	62.9	71.9	73.4	78.0	78.5	67.0	61.7	58.9	49.0	62.3
College Hill, Ohio	23.0	38.4	42.3	52.3	64.0	74.8	70.4	70.0	73.6	62.3	46.2	31.8	54.1
Collinsville, Ill	21.7	32.9	39.9	51.8	62.5	72.3	75.9	72.3	72.3	60.4	43.0	29.2	52.8
Conception, Mo	12.7	22.3	35.6	48.1	58.0	71.8	74.6	68.2	68.7	56.8	40.7	18.2	48.0
Contoocook, N. H	(1)	(1)	31.2	(1)	56.1	69.0	69.4	53.5	(1)	49.1	(1)	27.9	.....
Cooperstown, N. Y	17.7	27.5	28.8	40.8	54.0	65.7	64.5	66.5	61.6	48.3	36.0	27.0	44.8
Cornish, Me	16.1	24.5	(1)	(1)	(1)	68.8	65.2	(1)	61.7	46.6	34.2	(1)	.....
Cresco, Iowa	5.5	11.3	25.3	43.2	56.0	67.1	66.3	65.2	63.3	49.0	28.6	10.2	40.9
Crete, Nebr	16.2	19.5	34.6	46.0	59.4	69.4	73.2	68.7	67.7	55.7	36.5	14.1	46.8
Cumberland, Md	26.6	36.4	40.8	49.0	61.4	68.7	70.5	69.9	68.6	56.8	41.9	33.2	52.0
Dale Enterprise, Va	(1)	(1)	(1)	(1)	(1)	(1)	71.5	72.0	70.8	59.2	41.3	34.2	.....
Des Moines, Iowa	14.4	19.5	33.3	49.3	59.4	69.1	(1)	(1)	67.9	55.7	35.8	16.4	.....
De Soto, Nebr	14.6	17.3	33.4	41.0	60.4	71.2	73.0	69.2	67.0	54.7	36.5	14.7	46.1
Dillingersville, Pa	(1)	(1)	(1)	(1)	62.0	69.2	57.2	(1)	70.7	51.6	(1)	(1)	.....
Distributing Reservoir, D. C	29.6	42.3	43.7	52.2	66.9	75.6	77.0	77.1	73.9	61.2	44.8	36.8	56.7
Dorset, Vt	15.6	27.1	28.6	41.2	54.4	62.2	64.3	65.4	61.3	46.4	35.1	25.6	43.9
Drifton, Pa	(1)	27.3	29.0	40.5	53.7	65.7	64.1	66.3	63.1	49.4	37.8	30.5	.....

[1] No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Dyberry, Pa	17.3	27.9	29.5	41.7	55.3	66.8	65.2	65.6	60.8	49.0	35.2	27.5	45.2
Easton, Pa	(1)	(1)	(1)	(1)	64.1	74.0	74.7	77.9	71.4	56.2	42.3	34.3	.....
Elk Falls, Kans	18.0	26.0	34.0	38.0	(1)	(1)	70.0	(1)	(1)	(1)	(1)	(1)	.....
Embarras, Wis	6.3	12.6	30.1	43.6	58.6	69.5	67.8	67.2	64.6	51.7	31.9	17.4	43.4
Emmittsburg, Md	(1)	(1)	38.5	49.8	62.0	(1)	(1)	(1)	(1)	54.5	42.5	32.8	.....
Emporia, Kans	(1)	28.1	(1)	49.9	62.2	(1)	77.8	71.7	73.1	61.6	43.3	22.4	.....
Eola, Oreg	36.9	34.3	44.2	51.5	57.9	60.0	61.6	67.2	52.3	51.4	44.7	30.7	49.4
Factoryville, N. Y	19.0	29.8	31.8	43.2	55.2	66.8	65.6	67.2	64.0	49.6	35.9	28.2	46.4
Fall Brook, Cal	51.4	53.6	52.4	(1)	(1)	(1)	(1)	(1)	(1)	60.1	52.0	50.4	.....
Fall River, Mass	24.3	31.2	33.6	41.3	54.3	63.3	66.2	67.5	61.2	51.4	42.2	33.0	47.5
Fallsington, Pa	26.1	37.1	39.9	49.5	61.2	70.5	71.9	71.9	69.6	54.6	40.6	32.9	52.2
Fallston, Md	26.1	37.4	38.7	48.0	60.5	68.3	71.0	71.2	69.4	56.4	42.9	34.0	52.0
Fayetteville, Ark	26.8	38.3	46.4	55.0	62.6	71.0	77.0	71.0	(1)	(1)	(1)	(1)	.....
Forsyth, Ga	(1)	56.3	(1)	62.9	74.5	74.2	81.4	79.5	82.2	73.8	56.2	49.3	.....
Fort Collins, Colo	23.4	(1)	35.0	45.8	58.3	(1)	76.8	(1)	(1)	48.7	34.7	(1)	.....
Fort Scott, Kans	22.2	32.2	(1)	55.5	65.1	76.0	83.9	74.4	(1)	(1)	(1)	(1)	.....
Fort Wayne, Ind	20.0	30.0	39.0	48.0	60.0	71.0	72.1	71.0	69.5	56.0	39.8	29.0	50.4
Frankfort, Ky	23.9	41.6	(1)	52.7	64.0	72.8	(1)	72.1	71.4	60.2	(1)	35.3	.....
Franklin, Pa	15.3	28.1	30.4	(1)	52.2	63.4	61.5	61.5	59.5	47.2	32.5	25.2	.....
Fremont, Nebr	13.8	16.2	32.4	(1)	60.2	74.6	72.0	(1)	65.4	48.7	34.7	12.8	.....
Gardiner, Me	(1)	25.5	27.8	43.0	51.2	64.1	65.0	64.4	59.8	48.2	36.0	26.8	.....
Garrettsville, Ohio	(1)	30.8	35.0	44.8	57.9	67.8	68.0	66.9	66.3	53.6	37.7	28.8	.....
Genoa, Nebr	14.2	14.1	31.8	44.0	59.8	71.8	73.3	69.5	61.2	54.8	36.0	12.0	45.2
Grampian Hills, Pa	17.0	28.0	30.7	41.0	53.5	65.9	66.6	68.0	66.0	51.7	35.7	25.6	45.8
Grand Coteau, La	47.5	62.0	66.1	67.5	75.5	80.8	85.6	81.3	81.3	72.5	57.8	57.7	69.6
Grand Junction, Colo	(1)	(1)	(1)	48.3	(1)	(1)	(1)	72.0	63.5	(1)	(1)	(1)	.....
Great Falls Reservoir, Md	(1)	(1)	40.8	49.5	63.9	72.7	74.6	74.0	70.8	59.0	43.9	36.8	.....
Green Springs, Ala	37.6	52.2	57.0	61.0	71.3	73.5	80.0	77.3	76.2	68.4	49.8	(1)	.....
Guttenberg, Iowa	8.1	17.7	27.2	45.2	57.2	67.0	67.1	66.2	(1)	52.2	30.2	15.2	.....
Hartford, Conn	(1)	(1)	(1)	(1)	57.5	68.8	69.6	70.2	65.2	50.8	38.7	30.0	.....
Helvetia, W. Va	26.1	40.6	41.0	46.4	57.8	67.5	66.6	66.1	63.3	54.0	40.1	35.8	50.4
Highlands, N. C	26.8	39.0	42.1	45.3	60.0	61.2	66.6	64.2	59.8	53.5	36.5	36.3	49.3
Hiram, Ohio	(1)	34.6	33.3	43.8	(1)	71.7	70.6	70.1	67.3	53.7	36.9	28.2	.....
Holton, Kans	19.0	23.0	42.0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	41.0	21.0	.....
Hudson, Mich	15.1	27.2	(1)	(1)	(1)	68.9	69.8	64.8	66.2	53.1	33.7	24.3	.....
Hulmeville, Pa	24.6	35.6	(1)	(1)	62.7	70.1	71.9	74.0	(1)	(1)	(1)	(1)	.....
Humboldt, Iowa	6.3	9.8	26.8	42.6	55.2	66.6	67.2	65.8	62.8	40.6	28.6	3.6	40.4
Humphrey, N. Y	18.0	25.2	29.7	37.2	54.0	66.2	62.3	65.6	64.2	48.1	35.1	24.2	44.2
Hydesville, Cal	46.2	44.4	48.5	51.7	55.8	59.0	58.4	59.8	57.6	55.6	54.5	(1)	.....
Independence, Iowa	9.3	16.5	29.0	46.7	58.6	67.7	69.4	67.6	64.0	(1)	32.6	15.4	.....
Independence, Kans	22.0	31.0	44.1	52.5	63.8	73.1	78.3	72.8	73.9	60.8	45.6	25.4	53.6
Indianola, Iowa	15.1	20.8	35.4	49.3	61.2	70.0	72.0	69.7	67.8	55.9	37.5	18.0	47.7
Ionia, Mich	16.0	22.7	30.6	43.8	56.4	68.0	67.4	65.4	64.3	50.6	34.6	24.7	45.4
Ithaca, N. Y	19.5	28.6	30.4	41.5	56.0	68.9	66.0	68.6	64.6	50.9	37.5	29.2	46.8
Jacksonburg, Ohio	19.1	33.0	39.9	49.8	59.9	75.0	74.3	73.7	(1)	57.8	40.3	27.4	.....
Jeffersonville, Ind	(7)	39.1	44.0	53.2	64.3	73.3	75.0	72.9	68.5	60.6	49.6	34.2	.....
Johnsontown, Va	36.1	47.4	49.2	52.6	(1)	75.1	78.7	78.5	76.8	66.7	52.0	44.1	.....
Kelley's (near Raleigh), N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	78.0	73.0	66.9	51.0	45.9	.....
Laconia, Ind	23.0	39.7	44.0	52.8	64.2	70.3	75.3	72.5	71.5	60.5	44.2	33.6	54.3
Lafayette, Ind	17.6	29.5	37.1	47.9	59.5	71.7	71.4	69.8	68.8	55.2	37.6	25.8	49.3
Lansing, Mich	16.5	23.9	32.3	45.3	58.2	70.7	70.0	68.6	68.0	53.5	36.5	26.0	47.5
Lawrence, Kans	21.0	28.0	41.6	45.8	62.2	71.1	(1)	(1)	70.4	57.9	41.5	23.5	.....
Lead Hill, Ark	25.8	33.1	48.7	56.7	67.8	76.4	81.6	76.2	76.4	63.2	47.4	29.1	57.3
Leetsdale, Pa	21.9	35.0	35.9	45.5	50.5	69.8	69.0	66.7	60.2	48.3	37.2	29.5	48.2
Le Roy, N. Y	(1)	(1)	(1)	(1)	(1)	(1)	(1)	66.5	62.4	53.6	40.1	28.1	.....
Limona, Fla	(1)	63.6	(1)	71.0	78.9	78.7	81.4	80.5	79.8	74.3	70.8	65.9	.....
Lincolnton, N. C	(1)	(1)	(1)	(1)	(1)	69.8	76.7	73.5	70.6	67.1	36.3	37.4	.....
Logan, Iowa	(1)	21.3	36.7	(1)	64.5	71.3	(1)	70.8	69.1	53.7	38.6	17.1	.....
Logansport, Ind	18.6	29.3	37.6	48.9	62.0	71.6	72.5	71.8	70.4	59.2	40.4	26.8	50.8
Luling, La	(1)	(1)	(1)	(1)	(1)	78.1	82.5	78.2	75.0	(1)	55.2	(1)	.....
Lunenburg, Vt	9.1	21.8	24.8	39.2	51.5	65.5	64.6	64.8	58.4	43.6	30.6	21.6	41.2
Madison, Nebr	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	67.4	(1)	41.4	15.0	.....
Madison, Wis	9.2	16.9	27.4	43.4	57.1	66.0	67.7	66.6	65.1	51.5	32.2	16.8	43.3
Manatee, Fla	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80.8	81.4	78.9	71.2	69.8	.....
Manchester, Iowa	(1)	18.3	29.9	48.3	60.0	68.0	71.5	68.5	68.0	53.6	34.2	17.0	.....
Manhattan (B), Kans	(1)	24.4	39.5	51.0	63.1	(1)	78.8	73.6	74.8	59.4	(1)	(1)	.....
Manistique, Mich	10.1	(1)	23.1	38.1	48.6	59.3	60.7	61.1	58.8	49.0	30.6	21.6	.....
Manitowoc, Wis	18.2	29.8	29.0	41.2	52.6	62.3	67.5	64.9	62.7	51.3	(1)	22.3	.....
Margaretta Township, Ohio	23.7	26.3	36.0	40.5	64.3	72.0	66.1	71.7	60.6	59.5	48.8	(1)	.....
Marion, Va	27.0	42.5	45.0	49.0	62.0	67.0	71.0	70.0	69.0	58.5	42.7	35.6	53.3
Marquette, Nebr	21.2	22.4	(1)	51.2	67.1	80.0	80.2	78.3	(1)	(1)	(1)	19.5	.....
Mattoon, Ill	21.0	33.5	41.0	51.0	66.0	72.0	74.4	72.7	73.0	57.0	42.0	28.5	52.7
Mead, Kans	(1)	(1)	(1)	50.6	(1)	(1)	(1)	(1)	76.9	(1)	(1)	(1)	.....

[1] No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Maynard, Iowa	(1)	(1)	(1)	(1)	52.8	64.0	64.2	62.5	61.4	47.6	26.5	18.7	....
Mayport, Fla	58.8	63.7	67.4	69.2	75.6	76.8	81.4	80.2	80.1	76.5	65.8	62.1	71.0
Mazatlan, Mex	69.8	70.8	(1)	70.8	75.8	82.8	83.4	82.5	82.4	79.4	75.7	72.1	....
McDonough, Md	(1)	36.8	38.9	49.4	56.2	70.5	69.9	71.5	65.9	(1)	41.4	33.9	....
Menand Station (near Albany), N. Y	17.9	28.4	31.5	45.5	57.4	70.4	68.6	70.9	66.1	51.4	38.5	27.5	47.8
Mendon, Mass	21.5	29.9	31.2	43.4	56.6	69.4	68.3	68.8	65.7	51.1	38.8	30.6	47.9
Milan, Tenn	28.6	44.0	48.7	56.0	66.2	72.4	77.2	74.3	73.8	62.3	45.5	37.4	57.2
Milledgeville, Ga	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	52.7	48.8	....
Milton, Mass	(1)	(1)	34.4	48.0	53.8	65.0	65.5	66.6	62.6	48.8	39.1	33.0	....
Minneapolis, Minn	8.8	8.8	23.6	43.2	57.0	67.8	(1)	67.2	61.6	48.4	27.0	8.6	....
Monticello, Iowa	9.4	18.1	29.2	46.6	58.6	68.2	70.1	67.6	66.6	51.8	32.0	15.8	44.5
Moorestown, N. J	25.6	36.6	38.6	47.8	60.4	69.0	72.1	71.4	68.8	55.4	41.2	33.0	51.7
Mountainville, N. Y	29.7	31.3	33.8	44.9	(1)	68.4	68.1	69.1	65.5	52.2	36.5	29.5	....
Mount Forest, Can	31.5	26.0	36.0	43.0	54.0	67.5	65.0	66.5	59.5	51.0	32.5	31.0	47.0
Mount Ida, Ark	32.5	43.2	50.5	57.8	65.5	75.3	81.0	75.8	75.5	63.0	49.0	38.2	58.8
Mount Vernon, Iowa	10.0	19.4	31.8	50.1	63.0	73.0	73.7	(1)	(1)	56.9	34.7	17.2	....
Muscatine, Iowa	10.4	21.1	32.5	46.9	57.8	66.7	69.8	66.9	67.3	55.8	35.8	19.3	45.8
Neillsville, Wis	1.8	8.5	22.0	38.4	52.0	63.3	61.5	59.4	57.0	43.7	22.0	6.9	36.4
Nephi, Utah	22.5	25.0	35.5	42.2	51.3	63.8	66.9	64.3	54.8	46.1	33.2	30.7	44.7
New Athens, Ohio	(1)	(1)	(1)	(1)	(1)	(1)	(1)	70.1	(1)	55.0	39.0	30.0	....
New Bedford, Mass	26.1	33.1	(1)	(1)	(1)	(1)	66.3	67.0	64.4	52.1	40.9	33.4	....
Newport, Fla	46.6	58.0	57.6	65.3	(1)	(1)	(1)	(1)	(1)	(1)	56.5	57.3	....
Newport, Vt	10.9	22.9	26.8	41.1	54.2	66.1	65.9	68.2	62.9	46.0	33.4	21.9	43.5
New Tacoma, Wash	(1)	(1)	43.0	(1)	(1)	(1)	(1)	66.7	55.0	(1)	45.7	29.0	....
New Ulm, Tex	44.0	56.3	63.4	63.5	72.2	79.0	84.2	82.6	80.0	69.5	57.9	(1)	....
North Colebrook, Conn	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	34.9	27.3	....
Northfield, Minn	(1)	(1)	24.7	43.0	57.2	71.0	67.4	62.2	61.6	49.3	28.7	10.1	....
North Lewisburg, Ohio	15.8	33.0	37.8	48.5	61.5	72.4	76.2	72.3	71.0	60.5	39.2	29.9	51.5
Northport, Mich	15.0	22.5	25.5	42.0	56.0	68.1	68.0	(1)	(1)	(1)	(1)	(1)	....
North Volney, N. Y	16.8	26.3	28.6	40.4	(1)	67.4	64.9	68.5	65.5	50.2	35.9	26.5	.
Oakland, Cal	47.0	48.3	53.2	54.3	59.3	60.8	63.4	61.5	59.4	56.4	55.4	51.2	55.8
Orono, Me	12.1	22.4	27.1	42.5	50.0	64.8	64.2	66.1	58.9	45.3	37.1	23.6	42.8
Ottumwa, Iowa	(1)	(1)	32.8	49.6	61.4	73.8	74.0	69.2	68.6	50.7	36.8	18.9	....
Palermo, N. Y	14.1	23.8	26.6	38.3	52.4	65.1	62.9	66.1	62.0	47.8	33.6	23.5	43.0
Paramaribo (Dutch Guiana), S. A	77.5	(1)	(1)	(1)	77.8	78.3	78.4	79.9	80.0	81.1	80.3	78.4	....
Paterson, N. J	26.0	35.0	38.0	48.0	60.0	(1)	70.0	(1)	68.0	(1)	(1)	(1)	.
Peoria, Ill	17.7	29.2	38.3	51.9	63.9	73.0	75.7	74.3	73.3	59.1	41.8	27.3	52.1
Phillipsburg, N. J	(1)	36.5	(1)	(1)	(1)	78.9	74.4	73.6	69.9	55.6	(1)	32.4	..
Pierce City, Mo	28.1	34.8	44.9	52.9	63.4	70.7	75.6	71.4	72.9	(1)	(1)	29.2	....
Point Pleasant, La	(1)	(1)	(1)	(1)	(1)	(1)	(1)	79.5	77.3	68.6	52.0	48.9	.
Port Jervis, N. Y	20.4	30.1	31.8	45.2	57.7	68.4	68.5	70.1	62.9	48.7	36.7	28.0	47.4
Portsmouth, Ohio	28.3	40.9	42.5	51.6	62.0	71.1	72.2	74.5	69.8	58.1	42.4	33.9	53.5
Poway, Cal	50.5	(1)	53.8	56.6	61.6	65.2	69.7	72.5	65.0	59.5	54.6	50.0	....
Prairie du Chien, Wis	(1)	(1)	(1)	(1)	58.9	68.3	68.7	67.2	66.3	51.8	31.2	20.6	....
Princeton, Cal	46.8	46.9	53.5	(1)	66.3	67.7	74.7	76.9	67.4	63.0	56.4	50.0	....
Princeton, Mass	18.9	26.3	28.4	40.4	52.2	64.8	64.3	66.0	62.2	47.0	35.3	27.7	44.5
Providence, R. I	(1)	(1)	(1)	(1)	(1)	68.0	(1)	(1)	66.8	53.0	42.9	34.1	....
Pueblo, Colo	29.1	28.9	43.0	47.4	58.2	68.0	75.1	70.5	66.2	54.2	36.5	22.1	49.8
Puerto de Luna, N. Mex	(1)	(1)	49.3	(1)	63.6	74.4	82.3	73.6	(1)	58.7	45.1	36.8	....
Quakertown, Pa	22.6	32.3	34.2	46.1	57.6	66.5	67.6	77.5	(1)	(1)	40.0	30.4	....
Raleigh, N. C	38.0	(1)	(1)	(1)	69.0	(1)	(1)	77.0	76.0	70.0	(1)	44.5	....
Readington, N. J	(1)	(1)	(1)	(1)	64.0	73.0	74.0	76.4	73.9	59.8	45.7	38.0	....
Receiving Reservoir, D. C	29.3	41.8	43.2	52.1	66.4	75.5	77.3	77.0	74.0	61.2	45.8	37.3	56.9
Red Willow, Nebr	(1)	(1)	38.0	48.0	61.0	75.0	75.0	73.9	60.0	57.0	53.0	19.0	....
Richardton, Dak	(1)	(1)	20.8	37.1	55.0	64.7	64.4	64.5	54.6	46.2	30.1	3.2	....
Richmond, Ky	(1)	(1)	(1)	(1)	64.0	71.6	72.7	71.3	71.6	60.0	44.0	36.1	....
Riley, Ill	9.8	20.5	29.2	43.7	57.0	66.1	67.4	65.8	65.2	51.5	32.8	19.4	44.0
Ripon, Wis	9.0	15.1	28.0	42.7	56.5	67.3	66.6	65.7	(1)	(1)	(1)	(1)	....
Rock Creek Bridge, D. C	31.1	43.7	45.6	55.6	69.8	78.1	78.9	78.7	74.4	62.7	46.8	38.5	58.6
Rockford, Ill	10.8	21.5	29.2	46.6	59.6	67.4	69.2	67.4	66.9	53.2	34.4	21.4	45.6
Rowe, Mass	16.8	25.6	[illegible]	40.2	(1)	66.3	64.7	65.9	60.9	45.1	34.5	26.2	....
Ruggles, Ohio	19.9	32.7	34.1	44.4	56.7	67.6	67.6	66.6	64.6	53.6	37.3	28.5	39.5
Sacramento, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	56.8	51.3	45.9	....
Salina, Kans	22.9	25.2	40.8	49.6	62.4	75.6	79.6	74.8	77.3	(1)	42.0	23.2	....
Salinas City, Cal	46.3	49.1	52.7	53.9	58.2	59.2	59.5	58.5	57.0	50.6	(1)	47.6	....
Sandwich, Ill	(1)	24.9	33.7	(1)	60.8	70.5	71.3	70.8	69.9	55.1	35.6	21.6	....
Sherlock, Kans	(1)	(1)	44.4	49.4	60.3	75.1	81.3	77.0	71.8	59.2	41.0	15.9	...
Somerset, Mass	24.8	33.0	35.1	44.7	48.1	68.3	71.4	71.8	67.8	54.2	41.2	33.3	49.5
Somerville, N. J	23.4	33.6	36.4	47.8	60.6	71.3	71.7	72.6	69.6	54.3	40.0	32.4	51.1
Southington, Conn	20.8	20.5	32.5	44.4	56.8	67.2	65.5	68.9	64.7	50.7	36.8	29.4	46.8
South Orange, N. J	28.8	33.2	36.4	48.0	59.1	68.1	69.3	69.8	67.7	54.2	41.0	33.0	50.3

[1] No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Spiceland, Ind	(1)	(1)	(1)	(1)	60.6	71.2	72.2	70.0	70.1	55.9	38.5	27.2	.....
Springfield, Mo	(1)	(1)	(1)	(1)	65.5	73.3	80.5	74.2	73.2	59.9	45.6	31.8	.....
Stateburg, S. C	37.0	48.0	52.5	61.0	69.5	71.0	78.5	75.5	72.0	65.0	51.0	42.5	60.3
Statesville, N. C	(1)	(1)	52.6	57.9	70.5	78.4	76.7	77.7	75.8	67.1	50.1	43.8	.....
Sterling, Kans	(1)	(1)	(1)	(1)	(1)	(1)	77.5	70.0	(1)	(1)	(1)	19.1	.....
Stockham, Nebr	28.2	(1)	45.0	56.0	71.2	81.0	87.3	80.6	77.3	68.4	54.2	25.2	.....
Strafford, Vt	12.6	23.0	25.5	40.5	54.4	67.4	67.5	68.6	62.9	46.2	33.1	23.0	43.7
Summit, Va	(1)	(1)	(1)	(1)	(1)	(1)	74.5	73.8	72.5	60.8	48.2	36.4	....
Sunman, Ind	20.2	35.1	44.4	49.3	63.8	75.1	76.0	74.7	71.7	57.0	39.5	30.3	53.1
Sussex, Wis	10.9	17.7	26.8	40.3	54.6	64.7	66.0	65.3	67.6	50.9	33.4	17.9	43.0
Swanwick, Ill	22.1	33.9	43.4	52.5	63.5	71.8	75.5	73.0	72.3	(1)	(1)	29.3	.....
Swartz Creek, Mich	15.3	22.7	29.4	42.9	55.9	68.0	66.7	65.5	64.8	50.5	33.4	24.4	45.0
Sycamore, Ill	11.5	22.0	30.8	44.9	56.9	66.3	67.6	65.5	64.8	51.2	32.8	20.5	43.7
Tallahassee, Fla	(1)	(1)	(1)	(1)	(1)	(1)	81.5	81.2	(1)	68.5	56.0	49.0	.....
Tamaqua, Pa	(1)	(1)	(1)	52.0	67.0	78.0	74.5	76.2	72.0	55.6	40.0	31.0	.....
Taunton, Mass	24.6	36.3	35.3	45.0	55.7	65.3	68.0	68.7	65.6	52.8	41.4	34.0	49.4
Tecumseh, Nebr	(1)	(1)	(1)	(1)	(1)	71.9	78.0	73.3	72.3	62.3	41.0	19.7	.....
Thornville, Mich	16.4	24.6	31.0	44.1	58.0	70.1	68.1	68.4	72.1	53.1	35.0	27.4	47.4
Topeka, Kans	19.6	28.8	42.5	51.3	62.3	77.0	77.2	71.8	73.9	59.0	44.0	23.3	52.5
Troy, Pa	(1)	(1)	31.0	35.5	(1)	61.8	65.0	66.2	63.0	48.1	35.6	26.0	.....
Variety Mills, Va	30.5	43.4	44.5	52.1	(1)	69.3	72.7	71.3	68.9	59.1	42.4	38.1	.....
Vermillion, Dak	(1)	(1)	(1)	45.0	64.5	(1)	(1)	(1)	(1)	(1)	35.0	(1)	.....
Vevay, Ind	23.0	40.2	45.0	52.1	64.3	73.9	74.8	73.0	72.4	62.3	45.1	34.0	55.0
Vineland, N. J	28.1	40.2	41.4	(1)	64.9	(1)	75.3	72.9	69.5	58.2	43.2	37.7	.....
Wabash, Ind	18.7	30.5	37.3	47.9	61.6	71.1	73.2	71.0	70.5	56.7	38.6	26.0	50.3
Wausau, Wis	(1)	10.7	24.3	40.5	55.1	65.1	64.5	63.2	60.5	47.7	26.9	14.1	.....
Wauseon, Ohio	14.5	26.2	33.1	44.9	58.3	69.5	70.1	68.4	67.8	53.2	35.5	24.5	47.2
Webster, Dak	1.7	−0.3	18.8	29.8	57.6	76.6	73.1	71.3	62.2	52.3	34.9	9.1	40.6
Weldon, N. C	34.7	48.3	49.6	55.2	68.7	72.3	76.8	75.4	74.7	63.7	46.9	41.6	57.3
Wellington, Kans	23.9	26.6	41.0	50.7	60.3	71.5	78.4	70.1	74.5	60.6	42.9	28.1	52.0
Wellsborough, Pa	19.1	13.3	(1)	43.6	58.0	68.3	66.7	67.2	63.5	51.2	39.0	30.0	.....
Westborough, Mass	22.4	31.5	34.4	45.7	58.7	67.8	71.7	(1)	67.2	51.6	39.4	33.0	.....
West Chester, Pa	24.3	35.1	36.9	46.7	69.4	69.1	70.0	69.6	68.6	54.6	41.2	32.9	51.5
Westerville, Ohio	17.4	33.5	36.9	47.4	59.0	69.9	72.0	68.5	66.8	53.0	38.2	29.3	49.4
West Leavenworth, Kans	(1)	(1)	(1)	(1)	(1)	(1)	(1)	78.0	70.0	59.0	41.5	(1)	.....
Westmoreland, Kans	(1)	(1)	(1)	47.0	62.0	72.4	74.7	71.0	68.0	(1)	(1)	(1)	.....
West Union, Iowa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	30.0	18.8	.....
White Plains, N. Y	24.9	38.8	36.8	47.7	58.6	69.3	70.6	72.5	67.9	55.2	43.1	34.8	51.6
Wilkesbarre, Pa	21.6	32.3	33.8	45.9	58.2	70.0	67.2	68.7	(1)	51.6	38.4	30.8	.....
Williamstown, Mass	18.3	27.8	29.2	42.1	54.5	67.1	69.1	65.9	60.9	49.4	36.0	27.9	45.7
Wilton Centre, Ill	(1)	(1)	(1)	(1)	(1)	(1)	70.3	69.9	66.1	54.9	35.5	25.7	.....
Woodstock, Md	27.6	39.3	39.9	52.9	65.0	71.0	72.3	72.0	70.0	55.5	41.8	33.7	53.4
Woodstock, Vt	11.1	24.4	26.7	42.0	54.2	66.2	66.0	66.9	(1)	45.9	32.7	21.8	.....
Worcester, Mass	20.4	28.3	26.6	(1)	(1)	64.9	64.2	68.5	62.1	48.7	37.6	28.9	.....
Wyandotte, Kans	(1)	(1)	39.5	50.8	60.5	72.5	80.0	70.5	68.8	57.5	40.0	31.5	.....
Wytheville, Va	29.2	43.1	45.2	49.6	62.7	65.9	69.9	68.0	65.5	58.4	42.7	38.8	53.2
Yates Centre, Kans	19.5	27.7	41.8	45.6	61.8	70.6	78.7	73.5	73.9	58.8	39.5	22.8	51.2
Yutan, Nebr	(1)	(1)	(1)	(1)	(1)	(1)	75.4	70.4	68.1	55.8	36.5	14.3	.....

[1] No record.

APPENDIX 17.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees
Army, for the year end-

[From self-register

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Acootink, Va	52	0.4	73	12	69	10	80	33	92	50	96	54
Aiken, S. C	69	8	76	18	80	23	89	38	90	54	(1)	(1)
Albany, Oreg	59	24	66	8	66	31	80	40	88	46	88	52
Allison, Kans	62	—17	60	—20	77	Zero.	84	27	92	32	95.5	54
Altoona, Pa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Amherst, Mass	40	— 8	46	5	54	Zero.	70.3	31.2	85.2	37.6	92.5	52.2
Andersonville, Ga	70	12	81	26	81	26	91.8	40.4	93	65	(1)	(1)
Anna, Ill	65	—21	68	6	72	15	83	31	83	47	92	55
Ann Arbor, Mich	51	—16.6	(1)	(1)	(1)	(1)	68.5	30	(1)	(1)	(1)	(1)
Archer, Fla	79	21	86	36	93	36	90	44	95	61	90	63
Ardenia (Phillips'n), N.Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	30	93.5	47
Ashwood, Tenn	66	8	70	1	76	25	82	34	88	52	94	58
Atchison, Kans	63	— 6	(1)	(1)	70	8	77	30	86	41	90	55
Athens, Ga	(1)	(1)	(1)	(1)	(1)	(1)	87	33	89.5	50	90	52
Auburn, N. Y	47	—14	50	— 4	56	2	72	30.5	86	37	87	54
Austin, Tenn	64	12	68	4	73	22	82	32	86	42	(1)	(1)
Austin, Tex	76	20	(1)	(1)	84	32	87	41.5	92	49	96	64
Bainbridge Isl'd, Wash.	54	25	56	7	66	22	78	38	84	38	80	43
Bandon, Oreg	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	68	45
Beloit, Wis	39	—27	38	—10	65	— 9	79	28	79	32.5	86	43.5
Belvidere, N. J	(1)	(1)	(1)	(1)	(1)	(1)	68	35	(1)	(1)	(1)	(1)
Bethel, Conn	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	26	(1)	(1)
Birmingham, Ala	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Blacksburg, Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Blooming Grove, Pa	46	— 6	55	— 4	60	— 3	76	28	88	42	88	50
Blue Lake, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	43
Bowling Green, Ky	63	— 8	69	8	74	6	(1)	(1)	(1)	(1)	(1)	(1)
Boyne, Mich	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Brevard, N. C	60	8	71	11	74	11	84	28	88	40	94	44
Bunker Hill, Ill.	63	—27	62	— 1	72	5	84	31	86	38	95.1	50.3
Burlington, Vt	46	—14	49	—19	56	— 5.3	72.3	24.5	81.8	35.5	88.5	42.4
Carson City, Nev	56	— 5.5	52	—18	60	21	71	27	82	32	89.5	36.5
Carthage, Mo	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Catawissa, Pa	48	— 5	62	Zero.	65	Zero.	76.5	31.5	89.5	35.5	89.5	43.5
Cedar Rapids, (W.) Iowa	39	—34	44	—14	67	—10	80	23	80	33	88	43
Cedar Rapids, Iowa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Chambersburg, Pa	45	— 4	52	4	65	8	76	32	91	38	90	56
Chapel Hill, N. C	61	Zero.	76	16	80	16	88	35	94	43	98.5	41
Charlotte, Vt	39	—16	48	3	52	—12	73	26	82	38	91	48
Chester, Minn	39	—38	40	—24	63	—18	70	21	81	35	89	51
Cincinnati (G. W. H) Ohio	57	—20	70	— 2	76	9	83	33	93	46	98	60
Clarksville, Texas	71	3	75	10	79	30	84	34	83	50	93	56
Clay Centre, Kans	60	—17	63	— 9	(1)	(1)	(1)	(1)	(1)	(1)	95	55
Cleburne, Tex	72	1	78	16	84	28	90	32	92	46	96	58
Cleveland, Ohio	50	— 8.5	62	— 1	63	3	74	26.5	80	36	86	51
Clinton, Ind	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	38	94	50
College City, Cal	67	28	76	26	78	36	82	47	94	58	96	55
College Hill, Ohio	54	—19	60	— 2	70	4	(1)	32	90	40	96	61
Collinsville, Ill	64	—23	61	3	70	8	81.5	32	85	43	93	52
Conception, Mo	47	—31.5	53	— 9.7	68	0.5	73	25	80	35	85.1	57
Contoocook, N. H	(1)	(1)	(1)	(1)	56	—11	(1)	(1)	85	32	92	41
Cooperstown, N. Y	45	—10	46	— 1	49	Zero.	68	27	84	34	85	54
Cornish, Me	38	—11	47	3	56	— 4	(1)	(1)	83	38	92	46
Cresco, Iowa	38	—33	36	—18	66	—16	78	20	78	35	87	53
Crete, Nebr	45	—25.3	57	—16	73	— 4.6	80.6	24.5	87.8	32.2	91	44.8
Cumberland, Md	54	— 2	62	3	65	9	76	20	85	40	85	50
Dale Enterprise, Va	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Des Moines, Iowa	50	—31.3	51	— 8	72	— 8	77	23	80	41	86	54
De Soto, Nebr	46	—24	53	—14	69	— 4	75	25	84	32	94	45
Dillingersville, Pa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87	40	95	50
Distrib'ng Reservoir, D.C	48	5	71	12	65	14	78	34	90	45	93	55
Dorset, Vt	47	—19.5	57	— 1	53	— 9	70.8	12	82.5	29.8	87	38.5
Drifton, Pa	(1)	(1)	56	— 8	65	— 8	73	24	88	32	92	41

[1] No record

APPENDIX 17.

dsit) *from reports made by voluntary observers of the Signal Service, United Sta*
ember 31, 1884.
mometers.]

July.		August.		September.		October.		November.		December.		Ann ran
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
[illegible]	64	96	61	96	45	98	31	74	23	68	6	9
[illegible]	(1)	(1)	(1)	(1)	(1)	(1)	(1)	75	32	72	17	.....
[illegible]	54	96	52	74	44	72	34	66	36	58	6	9
[illegible]	57	95	48	97	32	80	19	80	4	69	—22.5	12
[illegible]	(1)	(1)	(1)	91	41	84	26	62	21.5	60	— 0.5	.....
[illegible]	57.1	92.4	48.8	90	39	78	26	61	20	57	—10	10
[illegible]	69	98.7	60.5	96.7	68	72	30	(1)	(1)	(1)	(1)	.....
[illegible]	65	93	56	98	58	89	32	71	16	67	— 7	11
[illegible]	(1)	(1)	(1)	89.1	43	(1)	(1)	58	12	(1)	(1)	.....
[illegible]	71	90	71	89	65	91	51	82	31	78	31	7
[illegible]	46	94	41	95	34	(1)	(1)	(1)	(1)	(1)	(1)	.....
[illegible]	65	98	58	92	48	94	28	72	24	62	3	9
[illegible]	62	91	54	92	49	88	30	68	8	60	— 8	.....
[illegible]	63	92	59	92	45	94	30.5	70	24	69	15	.....
[illegible]	51	87	46	86	37	77	32	63	20	58	—17	10
[illegible]	62	95	56	92	52	94	30	70	26	68	8	.....
[illegible]	75	98	70	94	71	88	50	77	36	74	27	.....
[illegible]	50	(1)	(1)	70	39	65	33	62	31	(1)	(1)	.....
[illegible]	48	73	45	(1)	(1)	(1)	(1)	61	33	(1)	(1)	.....
[illegible]	49	90	45	92	42	84	24	62.5	— 1.5	62	—19	11
[illegible]	67	(1)	(1)	84	50	76	39	(1)	(1)	(1)	(1)	.....
[illegible]	(1)	(1)	(1)	88	(1)	(1)	(1)	(1)	(1)	(1)	—10	.....
[illegible]	(1)	(1)	(1)	(1)	(1)	92	30	79	26	69	10	.....
[illegible]	(1)	(1)	(1)	88	35	88	23	69	19.5	64	— 4	.....
[illegible]	63	95	53	93	39	(1)	(1)	62	17	62	0.2	.....
[illegible]	40	88	45	76	36	73	32	69	33	59	23	.....
[illegible]	54.9	(1)	(1)	(1)	(1)	(1)	(1)	68	18	(1)	(1)	.....
[illegible]	(1)	(1)	(1)	(1)	(1)	(1)	(1)	65	11	51	—17	.....
[illegible]	(1)	90	54	89	42	92	25	79	26	66	10	.....
[illegible]	62	98	45	101	44	91	28	76	12	63	—13	12
[illegible]	(1)	(1)	(1)	91	36	75	29	57	17	54.3	—17.3	.....
[illegible]	38	95	39.5	88	28	77	22.5	66	14	64	4	11
[illegible]	(1)	(1)	(1)	(1)	(1)	87	35	78	18	67	— 5	.....
[illegible]	52	98	45	93	42	82	28	64	17	65	— 1.5	9
[illegible]	(1)	(1)	(1)	(1)	(1)	(1)	(1)	64	— 5	50	—32	.....
[illegible]	(1)	(1)	(1)	(1)	(1)	86	24	61	Zero.	49	—23	.....
[illegible]	58	95	52	98	39	84	30	64	17	60	3	9
[illegible]	56.5	99	56	99	49	100	30	79	26	78	7	10
[illegible]	58	98	54	92	40	72	29	58	10	52	—16	11
[illegible]	51	88	50	93	35	82	17	57	—22	41	—36	13
[illegible]	57	98	56	96	53	92	29	66	15	65	— 2	11
[illegible]	76	101	66	95	62	90	45	76	28	72	16	9
[illegible]	65	96	55	98	53	87	31	82	9	62	— 9	.....
[illegible]	72	96	56	96	66	80	41	80	24	76	8	9
97.5	49.5	88	48	87	42	82	30	64.5	15.5	60	—3.5	9
98	50	90	48	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
101	68	105	55	94	48	86	48	78	32	70	20	8
98.5	56	92	51	98	52	96	41	65	22	60	— 6	.....
98	50	94	48	94	49	87	32	75	14	62	—10	11
98	55	89	52	87.1	48.9	88	29	65	— 0.7	58	—13	12
98	44	95	43	(1)	(1)	80	25	(1)	(1)	58	—17	.....
95	54	87	43	87	36	77	24	60	18	56	—23	10
93	55	91	47	90	36	78	26	57	16	54	—18	.....
98	53	86	51	89	40	83	17	50	—15	41	—30	12
95.6	52.4	98	48	92	43	85	26	69	2	59	—10.9	12
90	51	86	54	90	41	84	23	64	24	56	4	9
97	51	98	56	97	42	92	26	70	20	68	— 2	.....
(1)	(1)	88	51	89	46	87	21	66	— 8	58	—23	.....
98	55	91	46	91	39	86	25	65	8	50	—19	12
90	58	(1)	(1)	95	52	80	22	(1)	(1)	(1)	(1)	.....
94	68	96	60	95	46	89	34	74	24	67	7	9
95	30	98	35	87	32	76	22	59	16	56.5	—20	11
[illegible]	47	91	40	91	37	81	22	68	14	62	— 8	.....

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[1] No record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Dudley, Mass	47	2	(1)	(1)	(1)	(1)	(1)	(1)	86	48	(1)	(1)
Dyberry, Pa	45	—16	45	—4	58	—6	71	21	90	27	91	36
Easton, Pa	42	1	56	6	64	5	(1)	(1)	92	47	95	54
East Portland, Oreg	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	86	42	88	56
Elk Falls, Kans	38	2	38	—4	50	26	56	32	(1)	(1)	68	51
Embarras, Wis	46	—35	40	—20	62	—15	75	26	84	42	90	49
Emmittsburg, Md	(1)	(1)	(1)	(1)	69	9	79	31	86	46	89	54
Emporia, Kans	(1)	(1)	60	—4	(1)	(1)	80	28	84.5	38	92	52
Eola, Oreg	57	18	60	3	62	25	75	41	86	43	82	52
Factoryville, N. Y	47	—21	59	—1	57	Zero.	72	25	97	30	88	40
Fall Brook, Cal	76	33	85	39	75	38	(1)	(1)	(1)	(1)	(1)	(1)
Fall River, Mass	48	1	52	4	62	8	65	26	78	33	90	40
Fallsington, Pa	47	—3	64	8	63	8	73	33	87	46	93	53
Fallston, Md	47	4	65	9	60	8	71	30	85	40	92	49
Fayetteville, Ark	67	—19	67	5	73	14	78	32	85	40	90	46
Flat Rock, N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Forsyth, Ga	72	6	78	20	80	26	(1)	(1)	92	59	92	63
Fort Collins, Colo	53	—11	(1)	(1)	58	12	71	12	78	31	(1)	(1)
Fort Madison, Iowa	40	—30	44	2	67	—1	83	28	82	44	91	56
Fort Scott, Kans	64	—24	64	1	78	17	80	31	86	42	95	58
Fort Wayne, Ind	52	—18	57	—7	70	3	80	30	82	40	95	55
Frankfort, Ky	58	—19.8	69	4	(1)	(1)	83	25	80.2	42.6	92.2	52.8
Franklin, Pa	42	—22	59	—12	60	—10	(1)	(1)	80	34	90	52
Fremont, Nebr	47	—26	53	—23	70	—9	79	24	87	29	96	47
Gardiner, Me	44	—19	44	Zero.	48	—19	63	24	75	32	84	37
Garrettsville, Ohio	(1)	(1)	63	—6	62	—10	76	27	82	30	92	40
Genoa, Nebr	42	—28	56	—22	69	—11	77	22	86	39	95	45
Germantown, Pa	40	—6	56	5	58	5	(1)	(1)	84	41	92	50
Grampian Hills, Pa	42	—16	54	—8	56	—4	72	22	88	29	86	46
Grand Coteau, La	76	20	78	28	80	38	81.9	39.8	85.2	58.1	96.2	65.5
Grand Junction, Colo	(1)	(1)	(1)	(1)	(1)	(1)	76	33	(1)	(1)	(1)	(1)
Great Falls Reserv'r, Md	(1)	(1)	(1)	(1)	61	10	77	32	89	43	90	52
Green Springs, Ala	67	4	76	20	80	32	83	40	87	60	92	58
Guttenberg, Iowa	42	—38	38	—18	68	—12	86	26	84	34	90	50
Hartford, Conn	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	90	32.5	97	49.3
Haverford College, Pa	40	7	60	6	59	6	68	32	85	30.5	88	41
Heath, Mass	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	32	92	50
Helvetia, W. Va	58	—7	68	—2	68	—8	78	25	88	36	96	40
Highlands, N. C	50	—8	64	—4	69	10	76	22	80	44	80	52
Hillsdale, Mich	49	—20	54	—7	60	—9	76	22	80	30	95	47
Hiram, Ohio	(1)	(1)	60	—12	61	Zero.	67	29	(1)	(1)	89	56
Holton, Kans	54	—24	59	—8	75	7	(1)	(1)	(1)	(1)	(1)	(1)
Hudson, Mich	47	—30	55	—8	(1)	(1)	(1)	(1)	88	28	91	47
Hulmeville, Pa	45	—8	62	8	(1)	(1)	(1)	(1)	85	38	96	50
Humboldt, Iowa	41	—33	44	—23	66	—10	70	27	80	36	86	36
Humphrey, N. Y	37	—9	54	—15	49	—4	70	24	84	33	88	50
Hydesville, Cal	65	30	78	24	68	34	78	40	80	46	76	50
Independence, Iowa	39	—29	40	—10	68	—10	74	27	76	40	82	56
Independence, Kans	62	—20	64	—1	75	16	78	28	91	35	99	49
Indianola, Iowa	47	—28	51	—8	69	—4	70.4	30	77	40	88	60
Ionia, Mich	45	—24	50	—18	60	—8	78	26	78.5	31.5	89	44
Ithaca, N. Y	46	—15	55	—4	56	—3.5	73	24	90	32	93.5	44
Jacksonburg, Ohio	40	—28	64	4	68	Zero.	89	26	89	38	101	54
Jeffersonville, Ind	(1)	(1)	70	11	74	10	82	32	88	43	90	54
Johnsontown, Va	61	4	76	19	72	19	79	37	(1)	(1)	91	58
Kalamazoo, Mich	42	—10	49	—1	62	6	(1)	(1)	81	39	90	51
Kelley's (near Raleigh) N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Kenewick, Wash	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Kiantone, N. Y	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Klamath Agency, Oreg	(1)	(1)	(1)	(1)	(1)	(1)	78	21	(1)	(1)	95	37
Laconia, Ind	60	—28	70	3	73	6	88	31	87	44	95	61
Lafayette, Ind	55	—28	60	—4	70	—5	79	28	80	36	90	58
Lancaster, Wis	(1)	(1)	(1)	(1)	67	—17	(1)	(1)	78	31	86	41
Lansing, Mich	47	—18	56	—13	64	—9	76	25	82	34	89	47
Lawrence, Kans	57	—21.5	57	—1	73	12	76.5	28.5	85	36	92	48
Lead Hill, Ark	69	—15	78	Zero.	79	17	87	28	98	46	100	51
Leetsdale, Pa	52	—12	65	Zero.	66	1	77.2	22	86.5	31.8	90	47.9
Lenoir, N. C	54	3	66	11	70	12	(1)	(1)	74	(1)	86	45
Le Roy, N. Y	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Liberty Hill, La	71	18	71	22	77	48	79	53	83	68	94	72
Limona, Fla	82	28	86	40	91	38	95	47	98	62	100	63
Lincolnton, N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	86	61
Logan, Iowa	48	—28	56	—10	70	—4	(1)	(1)	84	41	94	44
Logansport, Ind	60	—24	60	—5	72	—4	88	26	84	40	92	58
Luling, La	78	18	(1)	(1)	(1)	(1)	75	41	(1)	(1)	99	64
Lunenburg, Vt	46	—23	45	—4	50	—12	68	20	78	35	86	40

[1] No record.

Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Conti

July.		August.		September.		October.		November.		December.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
°	°	°	°	°	°	°	°	°	°	°	°
88	55	90	63	93	42	80	25	(1)	(1)	(1)	(1)
89	48	90	34	90	31	76	22	58	17	56	—15
96	61	98	62	98	46	88	36	62	30	70	4
86	52	94	50	70	42	68	38	(1)	(1)	54	8
78	56	(1)	52	72	50	65	44	51	15	(1)	(1)
85	56	86	52	85	46	85	25	62	—10	46	—30
(1)	(1)	(1)	(1)	86	51	86	31	65	24	60	— 4
98.7	58.5	93	51	94	50	87	34	69	9	61	—10
80	54	92	56	68	40	68	37	59	30	49	8
86	45	93	36	92	38	80	22	58	14	58	—12
(1)	(1)	(1)	(1)	(1)	(1)	92	40	90	40	78	34
82	53	83	47	89	45	79	27	63	22	58	—10
91.5	62	93	56	92	48	81	31	62	20	62	Zero.
93	54	91	52	93	45	88	29	67	22	61	Zero.
92.5	59	88	50	92	53	85	32	(1)	(1)	(1)	(1)
(1)	(1)	82	56	83	41.5	84	30	65	22	(1)	(1)
94	72	96	68	96	62	100	38	78	30	73	16
102	61	(1)	(1)	(1)	(1)	84	15	67	15	67	—11
95	62	93	59	91	49	85	27	60	10	50	—12
98	64	95	60	94	54	90	32	(1)	(1)	47	— 2
94	53	96	52	98	44	93	30	68	10	58	—13
(1)	(1)	90	49	90	50	89	27	(1)	(1)	65	— 6
88	46	88	46	88	33	80	20	61	12	53	—12
98	50	(1)	(1)	94	44	83	25	58	1	55	—24
83	48	83	45	83	34	74	28	57	16	59	—13
91	45	91	47	96	37	86	29	68	14	63	— 8
98	52	91	49	89	44	86	24	67	— 1	62	—24
99	57	92	50	92	48	80	31	(1)	(1)	58	0.2
94	50	94	59	94	36	80	22	60	10	58	—12
98	68	96	67	93	63	89	46	76	34	75	25
(1)	(1)	104	52	95	38	(1)	(1)	(1)	(1)	(1)	(1)
94	56	92	58	96	46	90	28	70	24	68	11
[illegible]	70	96	64	93	57	93	34	74	29	72	12
[illegible]	54	90	48	94	40	88	22	62	— 8	44	—24
[illegible]	54	96	42	94	33	81	24	64	18	59	—12
[illegible]	59	88	59	90	42	82	30	62	18	63	— 1
[illegible]	52	(1)	(1)	92	34	74	22	(1)	(1)	50	(1)
[illegible]	42	90	48	92	40	88	26	67	20	65	— 6
[illegible]	55	82	52	78	40	83	18	62	19	55	9
[illegible]	47	93	39	93	38	83	23	60	7	54	—19
85	59	90	55	91	49	82	29	60	10.5	69	— 4.5
(1)	(1)	(1)	(1)	(1)	(1)	90	26	73	10	62	—10
90	47	96	40	95	32	86	21	61	5	58	—28
94	60	95	48	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
90	50	88	48	89	44	84	18	61	— 2	48	—29
88	56	90	48	87	39	79	24	58	10	58	—18
76	50	80	30	76	42	76	40	70	40	(1)	(1)
85	58	84	56	84	48	78	26	54	Zero.	43	—22
100	55	96	53	94	53	91	32	73	16	64	— 8
92	60	88	55	88	47	84	26	65	4	53	—16
90	44	92	39	92	35	88	25	59	8	51.5	—23.5
91	48	91	39	90	34	83	22	60	15	58	—20
100	54	99	44	(1)	(1)	95	28	52	10	58	— 8
94	58	92	53	90	50	88	28	67	17	62	— 7.5
95	69	91	67	92	59	94	37	78	29	70	12
90	51	92	44	95	49	81	32	60	18	49	— 9
(1)	(1)	92	66	87	59	91	30	77	26	74	8
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	56	24	43	—26
(1)	(1)	81	52	(1)	(1)	75	28	(1)	(1)	(1)	(1)
93	35	96	30	(1)	(1)	(1)	(1)	(1)	(1)	52	—18.1
95	58	93	51	93	50	89	27	67	16	63	— 9
88	60	89	54	91	36	86	25	65	7	58	—31
(1)	(1)	89.5	40	(1)	(1)	84	17	61	— 9	45	—30
88	50	93	55	93	43	85	27	63	9	55	—22
(1)	(1)	(1)	(1)	92	48	85	31	70	10	59.5	— 6.5
[illegible]	62	100	52	103	51	97	31	86	16	67	4
95.2	45.7	92	46	92	36	75	28	70	14	62.5	6.5
88	56	86	61	89	45	80	30	68	23	64	10
95	46	94	41	95	34	84	21	68	16	63	— 8
(1)	(1)	95	83	92	82	87	40	74	31	70	29
96	72	96	71	94	69	93	52	85	41	84	34
98	68	77	70	85	53	83	42	(1)	36.3	(1)	33
96	54	88	50	93	44	86	22	64	Zero.	54	—24
99	52	98	51	96	43	90	30	70	10	62	—15
101	60	95	63	93	59	90	48	78	33	81	25
96	50	87	40	84	35	70	25	50	10	50	—26

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[1] No record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Madison, Nebr	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Madison, Wis	42	—27.2	37	—18	61	— 9.8	76	25	78	36	85	47
Manatee, Fla	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Manchester, Iowa	(¹)	(¹)	48	—14	68	— 9	80	31	83	38	90	47
Manhattan, (B), Kans	(¹)	(¹)	58	— 9	80	10	88	27	88	37	(¹)	(¹)
Manhattan, Kans	60	—23	63	— 6	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	101	64
Manistique, Mich	43	—21	37	- 26	62	—26	66	17	79	29.5	83	39
Manitowoc, Wis	42	—22	43	—14	58	—10	64	26	80	39	86	40
Margaretta Township, Ohio	50	—16	46	6	57	5	72	31	69	48	88.2	56.2
Marion, Va	60	— 8	68	Zero.	72	8	[illegible]	27	82	41	90	52
Marquette, Nebr	42	—22	50	— 3	66	10	78	32	81	41	89	67
Marshall, Mich	47	—12	43	— 8	59	8	80	30	81	42	92	53
Mattoon, Ill	62	—28	62	2	70	— 3	83	30	85	42	94	53
Maud, Kans	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	79	22	(¹)	(¹)	(¹)	(¹)
Maynard, Iowa	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	68	34	89	48
Mayport, Fla	75	27	82	41	86	43	86	55	89	69	90	70
Mazatlan, Mex	79	53	80.3	55.5	(¹)	(¹)	81.8	54	86	61.3	93	68
McDonogh, Md	(¹)	(¹)	68	7	62	3	72	33	84	41	87	49
Menand Station (near Albany), N. Y	46	—10	48	5	53	4	72	32	84	30	90.5	55.5
Mendon, Mass	42	— 4	53	0.2	58	3	64	28	83	40	88	51
Mendon, Mich	48	—21.5	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	82	41	97	46
Milan, Tenn	67	—10	72	13	76	24	84	31	87	46	92	56
Milledgeville, Ga	(¹)	(¹)	(¹)	(¹)	79	21	(¹)	(¹)	88	50	88	52
Milton, Mass	46	— 4	56	1	59	1.5	68	26	85	36	90	44
Minneapolis, Minn	38	—33	39	—18	58	—16	72	21	82	35	87	48
Monticello, Iowa	42	—33	44	—12	68	— 8	80	18	88	34	93	44
Moorestown, N. J	46	0.5	66	8	63	8	74	32	90	41	94	45
Mottville, Mich	49	—24	55	— 7	60	— 5	81	28	78.2	34	89	50
Mountainville, N. Y	49	—15	56	— 1	61	— 8	73	22	(¹)	(¹)	97	37
Mount Forest, Canada	40	—23	41	—11	49	—23	68	18	77.5	31	87	48
Mount Ida, Ark	72	— 2	76	10	78	20	84	27	84	48	94	50
Mount Vernon, Iowa	45	—35	46	— 8	65	— 8	84	25	88	41	94	53
Muscatine, Iowa	45	—28	45	— 4	66	— 3	82	25	81	36	89	45
Nayatt Point, R. I	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Neillsville, Wis	36	—36	35	—25	55	—24	69	18	75	29	89	36
Nephi, Utah	47	—12	49	—16	52	18	68	25	80	30	91	40
New Athens, Ohio	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
New Bedford, Mass	46	1	56	5	(¹)	(¹)	(¹)	(¹)	74	41	87	49
Newport, Fla	69	18	76	32	80	36	83	45	(¹)	(¹)	(¹)	(¹)
Newport, Vt	48	—29	48	— 4	54	—24	72	24	80	38	92	44
New Tacoma, Wash	55	25	(¹)	(¹)	61	28	(¹)	(¹)	(¹)	(¹)	76	52
New Ulm, Tex	78	12	70	22	84	33	86.5	40	79	61.5	95	62
North Colebrook, Conn	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Northfield, Minn	41	—29	34	—19	62	—12	71	18	80	31	89	43
North Lewisburg, Ohio	49	—23.5	59	— 4	65	2	78	27	84	34	94.5	50
Northport, Mich	37	— 4	48	— 2	50	— 3	70	28	76	37	86	52
North Volney, N. Y	41	— 6	45	3	58	2	74	26	(¹)	(¹)	89	53
Oakland, Cal	60	31	78	28	67	38	70	43	81	48	78	54
Ogreeta, N. C	50	— 2	61	11	70	19	66	40	72	57	77	66
Orono, Me	43	—29	44	— 8.4	50	—14	65.9	23.8	75.5	34.1	88.6	38.2
Oskaloosa, Iowa	34	—29	(¹)	(¹)	65	— 4	(¹)	(¹)	80	38	89	55
Ottumwa, Iowa	49	— 3.5	(¹)	(¹)	71	— 2	79.6	27.4	88	38	90	54.5
Palermo, N. Y	40	—10	43	Zero.	49	Zero.	71	25	85	33	89	54
Paramaribo (Dutch Guiana), S. A	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	88.6	69	89	70
Paterson, N. J	49	Zero.	52	5	69	6	72	33	87	40	(¹)	(¹)
Peoria, Ill	48	—27	49	5	67	Zero.	85	31	84	44	94	50
Phillipsburg, N. J	42	—10	58	2	64	4	(¹)	(¹)	(¹)	(¹)	92	54
Pierce City, Mo	62	— 9	70	— 6	73	18	80	28	89	35	92	48
Pleasant Grove, Wash	(¹)	(¹)	(¹)	(¹)	68	3	75	29	85	32	89	36
Point Pleasant, La	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Port Jervis, N. Y	38	— 3	50	2	57	1	(¹)	(¹)	87	39	92	53
Portsmouth, Ohio	58	—16	68	5	59	8	84.5	32	90	41	93	52.5
Poway, Cal	76	31	(¹)	(¹)	71	40	74	43	79	52	97	56
Prairie du Chien, Wis	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	83	42	89	58
Princeton, Cal	65	28	75	22	74	37	75	38	89	46	92	53
Princeton, Mass	40	— 6.5	52	— 2	50	— 3	63	20	81.5	27	89.7	41
Providence, R. I	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	87.5	32	95	40
Pueblo, Colo	60	—11	66	—13	70	16	74	30	88	38	90	54
Puerto de Luna, N. Mex	(¹)	(¹)	(¹)	(¹)	81	19	(¹)	(¹)	90	43	101	61
Quakertown, Pa	42	— 2	52	2	59	— 2	68	28	81	37	88	41
Quitman, Ga	70	17	(¹)	(¹)	82	41	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Raleigh, N. C	63	2	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	85	50	(¹)	(¹)
Readington, N. J	44	Zero.	54	16	62	6	76	36	90	46	100	58
Receiving Reservoir, D. C	51	4	72	10	67	13	83	33	93	44	94	52

(¹) No record.

Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
(1)	(1)	(1)	(1)	87	42	(1)	(1)	72	2.	64	—22	....
85	52	84.9	49.4	86	47	80	26	60	— 5	43	—20	113.2
(1)	(1)	92	65	92	72	84	61	86	50	86	42	....
96	54	90	46	94	45	85	24	62	— 4	50	—21	....
103	57	100	54	102	52	(1)	(1)	(1)	(1)	(1)	(1)	....
108	57	100	54	102	52	90	30	(1)	(1)	(1)	(1)	....
82	41	84	35	88	35	81	19	62	— 1	48	—19	114
85	46	84	45	85	42	84	24	(1)	(1)	47	—21	....
80	64	92	51	90	46	83	31	49	17	61	—15	108
88	50	88	56	89	42	88	24	66	20	66	— 2	98
92	71	90	66	88	58	83	35	60	—14	57	—14	114
87	60	93	43	94	43	84	32	(1)	(1)	(1)	(1)	....
97	59	98	50	99	54	93	30	73	11	64	—13	127
(1)	(1)	94	58	96	50	88	(1)	73	9	60	—12	....
88	50	87	48	90	34	81	16	58	—14	46	—30	....
95	76	91	73	90	72	87	61	77	48	80	40	68
92.2	66	94	66	92	65	90	60	86	61	82	55	....
89	(1)	87	58	89	44	87	28	67	20	62	— 1	....
88	57	91.7	50	88	46	76	31	59	20.5	53	—20	111.7
86	56	87	55	87	44	78	29	64	8	57	—10	98
97	45	93	41	98	44	(1)	(1)	(1)	(1)	(1)	(1)	....
95	64	99	54	97	50	93	27	75	21	65	5	109
94	64	92	61	89	51	94	35	78	26	71	18	....
85	54	85	50	86	40	78	32	63	19	68	—12	102
(1)	(1)	90	51	87	47	90	18	59	—18	46	—32	....
92	50	90	45	90	30	85	17	62	— 2	48	—24	126
92	62	93	46	94	47	83	30	64	17	64	— 2.	96
87	56	90	45	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	....
94	53	95	42	94	35	84	20.5	63	17	62	—14	....
84	46	90	43	88	31	76	26	54	11	44.5	—18	118
100	60	103	52	95	52	89	32	76	18	70	15	105
89	62	(1)	(1)	(1)	(1)	87	23	67	Zero.	48	—24	....
90.7	53	92	43.5	94	41	87	24	68	5	54	—19	122
(1)	(1)	(1)	(1)	96	44	85	32	62	26	66	—10	....
82	39	89	37	90	29	74	13	48	—22	87	—38	128
92	47	92	40	85	28	77	22	63	16	50	— 7	108
(1)	(1)	91	49	90	38	83	25	64	16	59	— 9	....
81	56	81	52	87	43	78	29	56.5	22	55	—10	....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	78.6	34	74.4	27	....
91	46	92	42	90	30	76	28	54	9	50	—23	121
76	51	89	52	69	42	(1)	(1)	61	29	51	7	....
100	72	86	79	83.9	74	90	50	80	30	(1)	(1)	....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	58	11	57	—20	....
88	44	87	50	90	41	82	18	60	—12	45	—38	128
90	52	92	48	96	37	87	25	64	11	56	—20	119.5
86	59	92	54	90	54	80	30	56	10	48	2	96
85	54	97	49	95	36	80	24	56	17	57	—15	....
88	55	78	54	76	47	75	41	70	42	63	30	60
79	61	80	62	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	....
84.1	49.1	89	44	88	30	78	23	58	9	59	—20	118
(1)	(1)	86	55	87	44	85	22	65	9	52	—20	....
94	60	92	57	95	42	91.3	27	70.1	6	56	—18	....
87	50	90	46	92	34	79	22	57	15	53	—19	111
89	69	91	70	92	70	95	70	94	69.5	92	69	....
90	60	(1)	(1)	93	49	(1)	(1)	(1)	(1)	56	— 2	....
98	39	97	50	94	50	90	29	68	16	57	—10	124
92	59	92	49	90	49	78	31	60	22	64	— 2	....
100	56	91	52	95	53	(1)	(1)	(1)	(1)	68	— 1	....
91	43	95	37	75	22	70	17	56	15	46	—25	....
(1)	(1)	97	66	96	61	92	39	76	32	71	17	....
90	55	90	48	88	42	82	30	56	16	56	— 7	....
94	48	93	51	92	44	89	26	70	20	53.5	— 5.5	110
101	59	104	59	90	53	87	41	87	33	78	30	....
87	54	90	51	90	46	86	23	62	— 6.9	46.3	—24.1	....
98	56	104	56	97	45	84	44	78	33	68	24	82
85.5	48.5	90	48	89	40	78	23	54	14	54	—18	108
(1)	(1)	(1)	(1)	92	39	81	28	67	18.9	62.2	—11.5	....
98	62	91	54	89	44	80	23	67	16	60	—15	111
108	72	99	63	(1)	(1)	(1)	(1)	67	21	(1)	(1)	....
86	52	88	45	(1)	(1)	(1)	(1)	60	17	52	Zero.	....
(1)	(1)	(1)	(1)	(1)	(1)	95	44	80	35	74	28	....
(1)	(1)	92	67	92	58	93	42	(1)	(1)	71	12	....
94	62	100	56	104	50	90	32	74	24	66	— 2	106
96	62	94	59	98	46	92	30	71	27	67	14	94

(1) No record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Red Willow, Nebr	49	—15	68	—14	77	Zero.	53	26	86	22	104	47
Richardton, Dak	88	—34	(1)	(1)	64	—17	71	13	76	80	88	51
Richmond, Ky	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	47	87.8	59
Riley, Ill	40	—31	38	—10.5	64	—10	77.3	25.5	78.5	32.6	87.1	45.8
Ripon, Wis	42	—30	36	—15.5	64	14	78	27	78	32	86	43
Rock Creek Bridge, D. C	49	6	74	11	70	16	83	33	97	50	96	60
Rockford, Ill	41	—28	39	— 9	64	— 8	79	29	78	42	87	51
Round Grove, Iowa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Rowe, Mass	46	—15	48	— 2	54	— 3	64	26	84	29	87	46
Ruggles, Ohio	45	—20	58	— 4	66	Zero.	80	24	88	36	91	54
Sacramento, Cal	62	27	74	25	72	36	80	38	87	48	92	53
Salem, N. J	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	89	50	98	42
Salina, Kans	52	4	48	8	65	11	68	35.8	70	46	84.5	63
Salinas City, Cal	65	30	76	25	72	34	72.5	44.5	80.5	50	72	54
Sandwich, Ill	42	— 6	(1)	(1)	66	— 7	(1)	(1)	82	44	93	54
San Rafael, Cal	(1)	(1)	(1)	(1)	(1)	(1)	74	56	86	40	(1)	43
Sherlock, Kans	(1)	(1)	(1)	(1)	76	11	83.6	31.1	88.6	33	96.5	56
Snowville, Va	59	Zero.	68	4	69	9	(1)	(1)	82	38	88	43
Somerset, Mass	42	— 7	53	2	69	2	76	26	89	32	98	42
Somerville, N. J	43	— 7.5	55	0.5	62	3	69.2	33.5	88.5	46.2	94	53.5
Southington, Conn	49	— 9	48	— 1	64	— 0.9	70	14	91	26	95	46
South Orange, N. J	44	4	58	4	64	4	76	32	88	40	92	46
Spiceland, Ind	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	35	95	54
Springfield, Ark	61	— 2	69	13	(1)	(1)	(1)	(1)	(1)	(1)	87	65
Springfield, Mo	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	89	46	98	58
Stateburg, S. C	66	8	75	21	77	28	84	38	86	53	89	53
State College, Pa	46	— 5	54	— 4	59	4	(1)	(1)	81	32	88	48
Statesville, N. C	(1)	(1)	71	16	78	16	82	36	90	51	93	54
Sterling, Kans	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Stockham, Nebr	50	6	58	2	68	16	74	38	82	48	94	74
Strafford, Vt	42	—14	44	— 2	46	— 4	66	22	80	34	90	52
Summit, Va	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sunman, Ind	51	—24	62	— 6	70	Zero.	84	38	86	34	94	56
Sussex, Wis	39	—27	36	—16	62	—12	77	23	78	30	88	44
Swanwick, Ill	64	—22	63	2	68	10	80	36	83	46	91	53
Swartz Creek, Mich	49	—25	61	—16	57	—15	69	28	81	28	88	43
Sycamore, Ill	39	—28	36	— 7	63	— 7	77	28.8	78	43	89	52
Syracuse, N. Y	(1)	(1)	51	2	55	2	(1)	(1)	86	40	94	58
Tallahassee, Fla	74	13	(1)	(1)	84	40	82	52	91	62	86	65
Tamaqua, Pa	(1)	(1)	(1)	(1)	(1)	(1)	76	28	90	46	100	56
Taunton, Mass	51	— 3	54	3	65	4	71	26	85	31	95	34
Tecumseh, Nebr	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	96	60
Terre Haute, Ind	57	—21	63	— 6	66	8	79	37	80	48	89	59
Thornville, Mich	47	—19	54	—12	60	—12	71	26	83	34	92	50
Topeka, Kans	59	—22.5	68	— 5	75	10	77	31	86	30	96	58
Traverse City, Mich	39	—22	45	—19	54	—23	75	17	78	30	90	44
Troy, Pa	49	—22	56	— 5	61	— 2	68	20	86	26	92.5	35
Variety Mills, Va	50	— 8.5	70	10	72	12	81.6	26.6	90.5	36.8	87.8	45.6
Vermillion, Dak	47	—34.5	53	—27	70	—10	73	22.5	84	29	(1)	(1)
Vevay, Ind	(1)	(1)	(1)	(1)	75	6	85	31	89	43	94	57
Vineland, N. J	52	4	67	10	68	10	(1)	(1)	92	42	(1)	(1)
Voluntown, Conn	50	— 4	55	Zero.	64	— 2	(1)	(1)	83	32	94	54
Wabash, Ind	54	—20	56	Zero.	67	1	76	32	81	40	91	56
Wausau, Wis	41	—32	36	—26	58	—25	70.5	20	79.5	30.5	89	39
Wauseon, Ohio	50	—31.7	58	— 8.1	65	— 7.5	78.6	21.5	82	29	92	48
Webster, Dak	39	—39	37	—33	54	—31	68	17	87	26	103	54
Weldon, N. C	61	Zero.	74	19	77	16	82	36	93	50	94	53
Wellington, Kans	58	—13	64	— 5	77	18	91	27	87	38	95	53
Wellsborough, Pa	42	—24	48	—10	(1)	(1)	72	26	84	40	95	50
Westborough, Mass	46	— 8	60	5	60	— 3	65	28	98	37	100	35
West Chester, Pa	48	8	60	5	60	4	71.5	31	86	38	90.5	45
Westerville, Ohio	(1)	(1)	(1)	(1)	65	— 4	79	27	86	33	91	49
West Leavenworth, Kans	55	—26	60	1	74	12	78	30	86	40	(1)	(1)
Westmoreland, Kans	(1)	(1)	(1)	(1)	(1)	(1)	80	21	85	34	95	46
West Union, Iowa	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
White Plains, N. Y	41	— 1	48	— 2	60	3	70	28	82	28	85	51
Wilkesbarre, Pa	50	— 9	59	— 1	60.9	— 2.5	76.1	26	91	32	91	40
Williamstown, Mass	39	— 6.8	49	4	49.9	— 2.1	67.5	27.7	80.7	31	85.6	40.5
Wilton Centre, Ill	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Woodstock, Md	48	— 2	68	5	65	5	80	28	91	38	91	41
Woodstock, Vt	45	—36	52	— 5	54	—16	75	17	85	25	96	36.3
Worcester, Mass	42	— 1	56	1	52	2	(1)	(1)	80	33	86	47
Wyandotte, Kans	(1)	(1)	(1)	(1)	70	9	73	28.5	81	40	90	55
Wytheville, Va	58	— 2	72	2	69	11	81	26	83	37	85	43
Wytheville, Va*	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Yates Centre, Kans	60	—22.5	62	— 4	76	6	77	26.4	83	32.5	93.5	47.4
Yutan, Nebr	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

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[1] No record.

* Three and one-half miles from.

Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continue

July.		August.		September.		October.		November.		December.		Annu rang
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
100	50	96	47	96	34	88	20	76	8	69	—14	119
88	50	91	49	78	32	80	8	58	—19	41	—36	......
93	62	90.7	56	90	57	88	30	64	17	66	— 8.5	....
87	50	88.8	47	90	45	81	24	63	— 1.6	51	—21	121
89	50	85	47	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	......
99	64	98	62	96	49	92	32	74	28	70	8	93
87	58	87	51	89	45	83	26	65	— 1	47	—19	117
(1)	(1)	(1)	(1)	92	50	86	28	63	Zero.	48	—24	......
86	50	86	56	87	40	74	28	56	14	57	—19	106
92	53	93	48	93	44	84	33	60	12	58	—14	113
96	51	95	53	90	41	80	37	74	31	65	23	73
97	65	95	48	95	50	85	37	70	26	65	5	......
87	72	94	65	86	62	79.2	41.2	54.8	14.5	44.8	—17	111
73	53	76	53	75	45	84	37	(1)	(1)	66	26	......
91	60	94	51	96	50	84	29	65	Zero.	54	—20	......
(1)	(1)	90	39	90	36	83	31	82	38	76	20	......
100.4	68.8	90.4	55.7	91.4	48	83	35	86	12	70	—16	......
87	47	86	55	86	40	84	26	61	20	70	— 2	......
94	46	91	44	94	39	86	24	64	18	58	—14	112
92	61	94	53	94	46	82	28	62	20	60	— 7	101
94	54	92	54	93	32	80	28	62	17	51	—13	108
90	58	92	50	94	50	82	32	67	20	60	Zero.	94
93	47	92	46	93	46	89	24	65	9	59	—17	....
87	70	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	......
98	70	99	56	99	50	96	30	78	17	63	— 5	......
93	64	91	60	89	55	94	36	72	30	68	—17	110
86	50	90	44	(1)	(1)	80	23	64	12	58	— 5	......
98	61	91	61	92	55	91	34	68	26	72	10	......
97.8	65	96	56	(1)	(1)	(1)	(1)	(1)	(1)	62	—10	....
96	74	92	68	90	64	88	46	84	20	67	6	94
84	54	90	56	86	32	74	26	54	14	50	—24	114
98	50	98.5	55	98	42	98	26	74	18	68	4	......
98	54	94	50	92	45	86	24	62	9	60	— 6	122
99	51	89	46	89	45	82.5	24	55	— 6	44	—25	117
94	67	93	55	94	53	(1)	(1)	(1)	(1)	60	— 8	......
86	45	90	37	91	36	83	23	58	10	54	—27	118
86	56	86.6	51	88	45	82	22	62	0.7	51	—19	117
93	56	92	58	99	42	(1)	(1)	(1)	(1)	(1)	(1)	......
91	72	91	71	(1)	(1)	93.5	44	78	34	76	22	......
94	60	96	58	98	53	85	32	60	20	56	— 4	....
86	50	93	50	97	37	86	26	65	18	63	—10	107
98	62	94	53	94	52	88	32	70	6	62	—14	......
82	59	85	54	83	49	81	30	64	16	56	— 9	110
90	48	93	46	92	43	84	27	60	12	53	—14	112
95	62	95	51	98	48	89	32	79	10	62	— 6	120
91	43	93	41	91	41	81	26	58	8	47	—11	115
91	51	92	33	91	27	82	17	59	18	56	—15	114
95	50	92	54	94.9	38.7	91	25	72	19	67	— 4	103
(1)	(1)	(1)	(1)	(1)	(1)	89	20	66	— 5	60	—30	......
90	54	93	51	92	47	90	27	70	16	66	— 6	......
95	59	91	56	92	43	89	26	67	16	64	— 4	......
89	58	94	50	82	40	84	28	64	18	62	—12	......
91	58	90	53	87	52	83	31	64	10	56	—15	111
84	40	86	38	84	34	80	20	57	14	41	—30	121
92	43.9	94.3	38.9	95.3	30.5	88	18	63	4.7	56.3	—32.4	127
97	48	95	43	93	25	88	Zero.	75	—25	61	—36	141
97	64	92	62	95	52	95	33	76	24	70	8	97
105	57	97	51	100	47	92	31	74	14	60	— 7	118
92	42	96	30	92	36	82	28	62	26	60	—12	......
93	55	(1)	(1)	96	36	82	26	66	16	61	—12	......
90.5	54	91	49	93	43	83	28	68	17	62	— 1	94
89	47	92	43.5	91	36	86	23	64	12	59	—22	......
100	59	94	52	91	49	86	32	71	12	59	— 3	......
98	51	95	48	94	46	(1)	(1)	(1)	(1)	(1)	(1)	......
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	62	—10	44	—25	......
88	60	85	56	85	48	85	25	65	16	59	— 6	94
90	49	94	38	(1)	(1)	82	23	64.1	16.5	49	— 7	......
84.2	54.2	86	46	83.4	38.4	73	25	51	21	58	—20	106
88	58	92	52	92	43	87	25	69	4	65	—24	......
98	49	92	47	91	37	87	28	67	17	61	— 8	101
98	42	96	38	(1)	(1)	74	25	56.6	10	52	—32	......
82	51	87	45	86	42	76	27	62	18	56	—12	......
97	68	93	48	91	46.5	86	29	67	13	60	— 3	......
87	45	86	48	86	38	86	25	67	20	67	Zero.	89
(1)	(1)	91	55	80	42	(1)	(1)	(1)	(1)	(1)	(1)	......
100	54	100	47	100	51	89.4	31.4	65	12	64	— 7	122
100	63	92	54	91	49	85	28	65	1	54	—21	......

(1) No record.

APPENDIX 18.

Monthly and annual mean temperatures (in degrees Fahrenheit) at military post hospitals, for the year ending December 31, 1884.

[The daily mean is obtained by dividing the sum of the 7 a. m., 2 and twice the 9 p. m. (local time) observations by 4. The monthly by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Abraham Lincoln, Fort, Dak.	2.2	− 2.6	18.5	38.6	57.2	71.1	65.9	68.3	57.2	45.9	27.6	1.7	37.6
Alcatras Island, Cal	48.3	47.9	52.3	53.2	54.9	56.6	57.3	55.5	56.9	55.2	55.4	51.5	53.8
Angel Island, Cal	52.4	51.6	52.8	56.8	60.8	61.4	63.6	60.9	60.5	58.0	57.2	52.2	57.3
Assinaboine, Fort, Mont	13.2	4.2	23.1	42.5	59.0	67.9	(1)	67.3	51.7	47.1	36.6	2.8	.....
Barrancas, Fort, Fla	43.8	55.7	64.8	69.0	77.8	81.1	85.2	84.4	(1)	(1)	(1)	(1)	.....
Benicia Barracks, Cal	47.6	48.1	53.4	55.9	61.7	63.1	68.2	68.3	64.3	60.4	56.5	50.2	58.1
Bidwell, Fort, Cal	33.3	29.7	37.4	44.2	55.8	58.5	63.9	69.1	54.0	52.4	46.0	30.3	47.9
Brady, Fort, Mich	8.0	8.7	18.5	36.8	49.3	64.0	59.3	62.0	57.7	46.6	30.6	18.0	38.3
Bridger, Fort, Wyo	20.6	16.8	28.1	35.7	48.9	60.5	66.2	62.6	48.9	42.7	34.7	25.6	40.9
Brown, Fort, Tex	(1)	(1)	(1)	(1)	(1)	(1)	85.6	84.1	82.0	74.9	66.4	60.7	.....
Buford, Fort, Dak	5.6	− 2.0	19.6	39.3	(1)	71.1	66.4	70.2	52.7	45.5	28.6	0.3	.....
Columbus, Fort, N. Y. H	25.8	34.5	37.4	(1)	58.8	69.0	70.8	71.9	70.2	56.4	47.3	33.8	.....
Concho, Fort, Tex	39.0	49.5	58.8	62.6	68.7	78.3	87.1	82.1	80.8	67.1	55.0	42.7	64.3
David's Island, N. Y	24.9	32.7	35.8	46.6	57.5	68.7	71.4	73.0	71.2	60.0	44.5	35.4	51.8
Ellis, Fort, Mont	17.3	18.0	27.5	39.0	58.2	63.4	63.8	65.4	47.8	44.5	35.2	3.5	39.5
Fred Steele, Fort, Wyo	(1)	(1)	39.9	35.5	50.0	65.2	69.6	65.5	55.4	45.3	31.8	19.1	.....
Gaston, Fort, Cal	41.9	41.7	47.8	53.3	62.4	63.8	68.1	72.6	59.9	54.0	49.7	41.7	54.7
Hamilton, Fort, N. Y. H	26.2	34.4	36.1	45.8	57.4	69.0	70.1	73.1	70.4	57.6	43.8	34.4	51.5
Keogh, Fort, Mont	12.4	7.6	25.8	40.0	(1)	(1)	67.9	70.6	54.7	48.1	33.8	5.3	.....
Klamath, Fort, Oreg	24.2	22.5	33.4	41.0	52.5	54.9	58.9	(1)	48.2	41.6	(1)	27.9	.....
Lewis, Fort, Colo	22.8	23.2	28.7	35.0	48.4	58.6	62.5	60.2	52.9	46.3	35.1	25.6	41.6
Lyon, Fort, Colo	24.2	26.6	40.8	49.0	59.9	71.3	79.1	73.8	69.5	57.2	40.1	20.4	51.0
Madison Barracks, N. Y	13.9	23.6	27.6	40.2	52.8	65.4	65.1	67.8	64.3	49.9	36.1	24.9	44.3
Mason, Fort, Cal	49.8	50.9	56.4	57.8	60.6	60.0	68.4	59.3	57.4	58.2	56.2	51.8	57.3
McDermit, Fort, Nev	23.8	22.0	32.5	39.5	46.1	57.3	68.3	70.6	51.4	46.8	41.2	29.1	44.0
McDowell, Fort, Ariz	49.2	(1)	(1)	63.8	(1)	84.1	95.9	87.6	77.6	(1)	50.2	48.8	.....
McHenry, Fort, Md	27.1	38.3	(1)	50.8	63.5	71.7	74.3	73.9	71.4	58.7	44.0	33.9	.....
Meade, Fort, Dak	20.1	8.0	26.6	38.2	51.8	65.9	64.7	63.6	55.3	48.7	37.0	6.5	40.5
Mojave, Fort, Ariz	51.7	52.5	(1)	67.3	77.0	85.5	93.4	92.2	81.8	73.3	65.6	51.9	.....
Monroe, Fort, Va	35.2	47.0	47.0	52.1	66.3	72.2	75.9	75.5	74.0	64.9	51.5	42.9	58.7
Mount Vernon Barracks, Ala	43.7	59.4	63.9	67.1	74.5	76.6	81.3	80.6	80.3	74.1	57.2	54.8	67.8
Niagara, Fort, N. Y	19.3	26.4	30.1	40.0	51.6	64.7	66.4	68.5	66.1	52.6	37.4	29.5	46.0
Pembina, Fort, Dak	− 8.6	−10.1	8.3	(1)	49.3	(1)	(1)	(1)	(1)	(1)	28.6	− 0.8	.....
Plattsburg Barracks, N. Y	9.7	22.0	26.9	41.8	53.9	67.1	66.8	69.2	63.2	47.6	34.5	22.6	43.8
Presidio, Cal	48.2	48.5	52.9	54.2	57.8	58.7	58.8	57.7	57.8	55.2	55.4	(1)	.....
Randall, Fort, Dak	14.0	8.5	29.8	45.7	61.0	78.1	72.6	70.8	65.3	54.4	35.5	11.6	45.2
Reno, Fort, Ind. T	30.5	35.5	(1)	55.8	65.3	74.6	81.9	76.4	78.1	60.8	47.5	27.9	.....
Robinson, Fort, Nebr	23.0	18.0	(1)	41.6	57.2	71.6	73.6	69.9	62.8	53.6	37.5	(1)	.....
Saint Augustine, Fla	51.6	60.6	65.6	75.4	74.6	76.0	81.1	79.3	79.3	73.4	63.8	60.9	70.1
Shaw, Fort, Mont	21.9	9.9	27.4	40.3	52.4	63.0	61.5	64.0	50.1	47.8	39.5	(1)	.....
Sisseton, Fort, Dak	− 0.4	−2.5	17.1	38.3	55.8	69.5	64.6	65.1	57.4	46.3	27.2	3.2	36.8
Snelling, Fort, Minn	3.7	8.0	24.1	44.0	58.6	68.5	68.2	68.0	62.9	49.5	28.1	8.9	41.0
Spokane, Fort, Wash	22.4	16.1	34.8	49.6	60.1	68.2	69.3	72.7	52.5	46.6	(1)	(1)	.....
Sully, Fort, Dak	11.6	5.5	27.2	44.0	59.7	73.7	70.9	71.2	64.2	52.9	34.2	8.7	43.6
Totten, Fort, Dak	− 2.2	− 4.6	13.3	36.3	56.1	69.6	64.2	65.8	55.4	42.6	23.9	0.3	35.1
Townsend, Fort, Wash	40.0	34.9	43.0	52.0	56.1	61.1	61.4	63.2	53.9	49.8	47.3	33.0	49.6
Union, Fort, N. Mex	31.5	34.7	39.3	43.6	52.6	61.9	72.4	63.9	60.6	(1)	43.5	32.5	.....
West Point, N. Y	(1)	(1)	(1)	46.3	58.7	70.2	70.5	(1)	67.9	(1)	41.0	31.9	.....
Wingate, Fort, N. Mex	31.7	33.4	39.1	45.[illegible]	57.7	67.4	75.0	67.5	62.2	53.4	42.0	36.0	50.9
Yates, Fort, Dak	5.9	1.4	21.1	40.8	58.7	72.4	67.5	69.2	59.0	47.7	29.2	5.2	39.8

(1) No record.

APPENDIX 19.

Monthly maximum and minimum temperatures (in degrees Fahrenheit) and annual range

[From self-regis

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Abraham Lincoln, Fort, Dak	40	—45	44	—35	60	—18	72	15	84	29	92	42
Alcatraz Island, Cal	58	39	70	29	66	41	65	44	73	47	75	49
Angel Island, Cal	71	38	77	28	82	43	77	38	93	49	88	52
Assinaboine, Fort, Mont	45	—31	44	—40	55	—32	75	12	88	27	101	44
Barrancas, Fort, Fla	74	10	85	27	85	34	86	43	93	61	96	61
Benicia Barracks, Cal	61	34	78	28	72	40	78	44	86	51	82	55
Bidwell, Fort, Cal	56	5	67	—19	63	15	77	25	78	26	81	37
Brady, Fort, Mich	36	—32	38	—29	57	—28	69	17	74	29	91	36
Bridger, Fort, Wyo	44	—15	44	—39	47	Zero.	57	14	73	20	84	30
Brown, Fort, Tex	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Buford, Fort, Dak	44	—48	45	—43	58.8	—22.7	76	10	85.5	25.2	100	34
Columbus, Fort, N. Y. H	45	6	56	6	62	7	(1)	(1)	85	42	92	49
Concho, Fort, Tex	78	5	82	17	89	26	96	32	95	44	100	53
David's Island, N. Y	47	4	54	3	61	4	67	30	86	39	93	44
Ellis, Fort, Mont	48	—17	50	—26	54	—14	70	20	82	20	93	30
Fred Steele, Fort, Wyo	(1)	(1)	(1)	(1)	55	—2	68	12	80	16	93	36
Gaston, Fort, Cal	62	26	74	20	72	33	80	38	95	36	90	42
Hamilton, Fort, N. Y. H	50	—2	54	—5	62	5	70	31	85	42	91	45
Keogh, Fort, Mont	45	—32	55	—38	68	—25	78	12	(1)	(1)	(1)	(1)
Klamath, Fort, Oreg	45	—5	56	—30	56	6	70	20	82	21	85	31
Lewis, Fort, Colo	50	—14	48	—21	51	—1	60	13	71	22	84	35
Lyon, Fort, Colo	66	—7	69	—23	80	9	80	23	91	17	98	47
Madison Barracks, N. Y	41	—29	51	—8	52	—8	73	12	81	31	90	40
Mason, Fort, Cal	59	41	68	39	73	48	73	50	78	50	75	50
McDermit, Fort, Nev	49	—2	49	—18	58	22	56	31	62	35	84	40
McDowell, Fort, Ariz	71	23	85.8	23.7	79.8	36.5	92	37	102.2	43.5	118	50
McHenry, Fort, Md	50	6	64	8	62	13	77	32	87	45	81	51
Meade, Fort, Dak	54	—21	57	—28	66	—11	73	12	82	25	97	38
Mojave, Fort, Ariz	71	32	78	27	(1)	(1)	92	44	100	53	110	59
Monroe, Fort, Va	68	3	67	27	72	20	77	38	88	50	89	55
Mount Vernon Barracks, Ala	74	10	80	24	84	33	87	40	92	55	96	54
Niagara, Fort, N. Y	47	—9	57	—3	55	—2	72	26	79	32	86	44
Pembina, Fort, Dak	34	—35	34	—37	39	—26	66	9	83	29	(1)	(1)
Plattsburg Barracks, N. Y	45	—27	49	—3	51	—5	66	15	79	36	88	40
Presidio, Cal	62	37	73	28	73	38	70	41	85	42	70	47
Randall, Fort, Dak	48	—29	53	—29	70	—12	74	22	89	33	96	40
Reno, Fort, Ind. T	69	—4	72	3	(1)	(1)	85	31	89	37	93	55
Robinson, Fort, Nebr	51	—22	56	—39	(1)	(1)	76	10	88	26	97	46
Saint Augustine, Fla	77	22	83	42	85	40	86	45	90	62	91	63
Shaw, Fort, Mont	51	—15	53	—32	55	—22	71	21	81	27	91	45
Sisseton, Fort, Dak	45	—44	42	—29	46	—28	65	16	79	27	89	44
Snelling, Fort, Minn	43	—33	37	—25	61	—20	74	18	88	31	99	35
Spokane, Fort, Wash	51	—5	49	—32	65	3	77	29	91	30	95	37
Sully, Fort, Dak	52	—30	57	—30	72	—6	75	20	88	33	99	47
Totten, Fort, Dak	35	—39	38	—31	42	—21	66	10	82	29	96	45
Townsend, Fort, Wash	57	25	57	8	60	26	72	36	80	36	88	40
Union, Fort, N. Mex	65	—13	67	—21	63	9	72	15	79	12	88	33
West Point, N. Y	(1)	(1)	(1)	(1)	(1)	(1)	74	29	87	33	97	42
Wingate, Fort, N. Mex	51	7	56	—8	59	11	69	18	77	26	87	34
Yates, Fort, Dak	42	—44	49	—38	56	—14	79	19	83	34	97	48

[1] No record.

APPENDIX 19.

perature at military post hospitals for the year ending December, 31, 1884.

thermometers.]

July.		August.		September.		October.		November.		December.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
°	°	°	°	°	°	°	°	°	°	°	°
[illegible]	42	96	42	82	30	80	10	65	—15	48	—48
[illegible]	48	65	48	69	46	68	47	70	48	65	38
[illegible]	51	85	52	80	51	83	47	76	46	72	32
[illegible]	(¹)	95	37	80	21	85	10	70	—15	65	—50
[illegible]	70	96	67	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
[illegible]	56	95	54	90	52	78	47	69	43	64	32
[illegible]	40	88	48	78	30	78	25	70	29	58	2
[illegible]	37	88	35	88	38	76	18	62	5	48	—24
[illegible]	30	84	31	78	19	75	15	55	14	60	— 9
[illegible]	77	97	71	96	69	87	60	81	47	83	29
[illegible]	38	102	39	82	24	86	11	62	—12	58	—43
[illegible]	58	92	56	93	50	84	31	63	19	60	8
[illegible]	68	108	60	101	63	95	42	80	28	88	10
[illegible]	46	94	61	95	35	85	18	65	21	62	— 7
[illegible]	36	98	37	85	25	81	18	67	— 1	60	—13
[illegible]	32	91	38	87	26	76	9	62	2	55	—24
[illegible]	41	102	46	87	40	76	34	78	35	63	16
[illegible]	47	97	52	95	45	89	30	62	21	60	— 1
[illegible]	45	108	39	86	28	87	11	69	—24	55	—48
87	30	(¹)	(¹)	76	16	78	11	(¹)	(¹)	54	—15
88	30	87	38	75	23	70	20	60	12	58	—18
104	52	104	42	95	27	89	27	74	7	70	—21
90	44	88	42	87	30	79	19	59	4	57	—29
81	54	74	50	69	50	76	49	71	46	63	40
[illegible]	48	95	47	86	32	77	25	66	21	55	— 2
116	66	118	50	103	51	(¹)	(¹)	89	34	80	24
[illegible]	61	90	57	92	49	85	32	71	23	62	4
95	40	96	34	83	20	86	13	71	—12	73	—32
113	67	114	68	103	55	95	47	85	37	79	30
[illegible]	68	90	64	89	58	89	38	78	30	69	9
[illegible]	64	101	58	97	57	98	36	78	27	80	15
[illegible]	59	92	45	90	44	81	25	62	15	54	Zero.
(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	56	—19	44	—47
[illegible]	46	96	42	92	84	79	26	58	8	53	—19
88	46	75	48	78	43	77	48	71	44	(¹)	(¹)
95	47	96	44	97	36	89	18	78	— 4	58	—31
101	62	101	58	98	52	90	35	76	19	68	— 1
101	40	97	42	94	52	87	14	73	— 8	(¹)	(¹)
92	63	91	70	89	66	86	58	77	40	80	85
85	38	92	37	82	21	80	21	68	- 4	(¹)	(¹)
85	44	86	41	86	32	78	12	62	—22	42	—38
[illegible]	46	101	45	95	38	85	19	61	—15	46	—37
96	42	108	44	81	81	71	24	(¹)	(¹)	(¹)	(¹)
100	51	99	48	96	35	99	19	72	— 7	59	—37
86	43	94	44	88	34	85	12	61	—21	45	—40
78	45	86	45	67	37	64	38	63	28	55	11
95	47	92	43	82	33	(¹)	(¹)	67	14	67	—10
94	54	(¹)	(¹)	95	45	(¹)	(¹)	64	18	64	—12
92	48	87	43	81	30	76	24	59	13	56	— 4
86	42	96	45	90	29	89	11	68	—21	52	—37

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¹ No record.

APPENDIX 20.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, for the year ending December 31, 1884.

[The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by two; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Alta, Cal	43.2	39.4	43.2	47.0	58.0	61.8	69.8	72.6	58.8	55.7	57.4	41.0	54.0
Anaheim, Cal	57.0	60.4	63.8	65.0	69.2	71.5	74.2	75.4	69.0	68.5	58.9	56.1	65.7
Antioch, Cal	43.5	44.8	48.7	55.2	64.6	67.6	73.8	73.6	66.4	59.3	52.6	45.8	58.0
Aptos, Cal	(1)	(1)	(1)	(1)	(1)	(1)	62.4	60.3	60.2	53.4	51.8	49.9	.....
Auburn, Cal	45.3	43.8	48.7	51.9	62.1	68.5	72.0	76.6	64.2	58.7	53.6	45.3	57.1
Battle Mountain, Nev	26.9	21.0	40.1	45.7	61.9	66.2	74.8	76.6	58.8	46.9	38.2	34.2	49.2
Benson, Ariz	45.4	54.1	57.0	64.1	75.4	(1)	92.0	84.5	76.5	70.2	56.8	48.[illegible]	.....
Beowawe, Nev	25.6	24.1	37.6	46.8	57.6	64.6	72.5	75.4	57.1	50.5	39.7	31.8	48.6
Bishop's Creek, Nev	(1)	(1)	45.4	57.4	65.8	69.9	85.5	80.9	64.5	60.9	48.7	49.4	.....
Blue Creek, Utah	23.5	26.0	39.8	45.8	60.4	69.8	71.3	75.8	60.2	50.2	42.0	30.2	49.5
Boca, Cal	22.6	18.7	30.0	37.4	49.0	56.2	60.7	64.6	51.1	46.0	35.8	31.6	42.0
Borden, Cal	49.2	52.0	59.8	60.1	68.8	69.5	77.6	86.6	69.6	58.2	58.4	50.6	63.4
Brentwood, Cal	45.5	46.4	58.6	54.4	64.0	66.7	76.3	76.9	67.5	65.5	54.6	48.0	60.6
Brighton, Cal	47.2	48.4	54.0	57.8	66.9	68.3	72.9	76.4	66.7	60.3	55.7	48.5	60.3
Brown's, Nev	30.8	30.4	44.0	52.6	68.0	74.1	82.6	88.9	65.6	54.5	42.6	36.9	55.5
Byron, Cal	47.2	50.0	59.8	58.3	68.3	70.9	82.1	81.3	69.6	63.0	59.0	51.2	63.4
Cabazon, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	82.5	73.4	68.6	62.2	49.4	.....
Caliente, Cal	47.7	49.5	54.8	55.2	70.0	70.9	82.5	81.7	72.0	64.1	52.0	47.6	62.3
Calistoga, Cal	45.3	45.6	50.8	55.2	64.8	67.2	72.2	72.2	64.2	59.8	53.2	48.7	58.3
Carlin, Nev	17.9	17.9	34.2	42.5	55.4	62.9	68.1	68.3	51.9	45.6	33.2	26.8	43.7
Casa Grande, Ariz	58.2	54.6	59.1	69.1	80.5	88.6	96.7	91.5	83.4	76.8	66.6	54.5	73.0
Chico, Cal	46.6	44.4	53.8	60.7	71.2	70.2	84.1	86.7	69.1	68.4	57.5	50.6	62.8
Chualar, Cal	48.8	49.5	51.5	54.3	(2)	57.7	61.0	59.7	56.9	53.1	51.3	49.2	.....
Cisco, Cal	32.8	27.5	31.2	34.8	43.4	51.0	63.1	63.1	46.9	45.5	42.6	29.9	42.6
Colfax, Cal	45.6	44.1	46.9	49.9	62.6	63.0	78.8	77.2	65.7	59.0	55.9	46.2	57.5
Colton, Cal	49.8	55.8	61.2	59.1	66.0	69.6	75.4	76.8	65.8	59.5	55.9	50.7	62.0
Corinne, Utah	22.9	26.5	39.2	49.5	61.4	72.5	77.8	77.4	59.5	51.6	39.1	32.9	50.9
Daggett, Cal	46.2	48.1	50.8	56.4	66.9	77.8	88.7	86.8	(3)	.....	.....	.....	.....
Davis, Cal	44.6	49.2	57.2	61.5	74.5	74.2	82.5	86.3	61.9	64.6	60.1	51.4	64.0
Delano, Cal	44.8	49.0	47.2	58.5	(2)	70.2	80.9	83.6	71.8	61.1	60.2	59.5	.....
Delta, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	55.8	48.7	40.0	.....
Deming, N. Mex	42.8	48.0	57.7	61.4	69.8	77.5	85.6	81.1	76.8	69.9	54.8	53.1	64.9
Dunnigan, Cal	48.6	49.2	56.0	64.6	69.8	71.9	80.7	79.2	72.8	61.7	54.5	47.5	63.0
Elko, Nev	20.6	18.0	35.8	45.6	58.1	65.8	71.0	68.6	51.5	44.0	31.7	29.2	45.0
El Paso, Tex	39.5	41.4	46.4	51.8	64.3	(1)	(1)	83.8	(1)	64.0	47.4	44.0	.....
Emigrant Gap, Cal	35.5	31.7	36.2	38.4	50.8	53.9	62.0	62.1	52.9	50.6	48.7	37.2	46.7
Farmington, Cal	45.4	48.2	52.6	57.9	67.0	70.5	72.8	72.6	69.2	62.2	54.4	46.0	59.9
Fenner, Cal	40.0	48.9	54.5	64.2	73.3	84.4	89.6	(1)	79.0	(3)	.....	.....	.....
Fresno, Cal	46.7	49.5	54.8	59.4	70.9	73.5	82.5	(1)	71.1	65.8	60.9	55.7	.....
Galt, Cal	47.7	48.8	56.6	60.0	66.7	75.4	78.6	71.3	66.8	56.2	53.4	49.0	60.9
Gilroy, Cal	46.5	48.4	54.1	56.8	63.0	65.2	71.1	69.9	65.6	60.0	53.8	49.6	58.7
Golconda, Nev	31.6	30.2	44.0	53.2	64.7	(1)	76.5	81.7	63.9	58.9	47.3	40.1	.....
Goshen, Cal	47.8	53.1	56.8	59.4	70.0	71.1	85.5	88.8	77.2	62.2	54.8	48.9	64.6
Halleck, Nev	15.7	17.9	38.1	43.8	53.1	58.0	66.1	62.5	(1)	51.4	24.8	28.1	.....
Hawthorne, Nev	(1)	(1)	49.0	57.0	68.4	73.9	82.4	83.1	61.6	55.2	49.2	39.2	.....
Hollister, Cal	49.6	53.3	53.1	56.0	62.9	67.4	70.6	69.5	66.2	61.6	57.3	52.4	60.0
Hotel del Monte, Cal	49.5	50.6	54.5	57.0	59.7	61.1	61.0	61.1	57.5	54.4	52.2	52.0	55.9
Hot Springs, Nev	28.9	26.5	40.5	48.9	65.2	60.7	67.1	72.6	54.0	49.5	41.2	34.0	49.1
Humboldt, Nev	28.2	25.9	40.4	48.8	60.4	67.8	68.9	(1)	51.7	38.1	35.9	35.3	.....
Indio, Cal	52.8	56.4	61.7	67.9	76.0	82.5	93.3	91.7	82.1	74.6	62.6	61.9	71.9
Ione, Cal	52.4	53.2	55.9	66.7	69.7	68.7	75.6	82.2	70.1	62.9	53.2	50.0	63.4
Keeler, Cal	(1)	(1)	(1)	65.6	77.1	82.9	93.5	91.1	84.8	67.9	57.5	41.8	.....
Keene, Cal	42.7	41.2	45.1	50.5	60.1	67.2	75.9	74.2	59.3	55.6	52.5	42.0	55.5
Kelton, Utah	20.2	23.8	37.1	45.4	59.9	70.8	75.4	72.3	56.0	(1)	35.6	33.4	.....
Kingsburg, Cal	56.2	53.5	56.4	61.7	71.5	75.8	83.6	84.7	72.2	66.0	60.9	51.0	66.1
Knight's Landing, Cal	49.4	47.7	54.0	58.0	67.2	70.6	75.0	(1)	67.6	63.0	58.9	52.1	.....
Lathrop, Cal	43.5	47.8	52.4	57.9	63.6	64.8	69.6	(1)	73.0	57.6	49.9	46.3	.....
Lemoore, Cal	52.1	46.6	51.9	56.1	71.6	72.7	81.1	85.9	(1)	63.7	53.2	45.7	.....

[1] No record.

[2] Record incomplete.

[3] Observations discontinued.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Livermore, Cal	49.7	49.2	54.1	54.4	59.8	62.2	67.6	67.5	63.8	60.2	55.5	50.0	57.8
Lordsburg, N. Mex	38.5	46.1	51.5	62.7	77.1	85.7	91.8	80.4	74.8	62.9	49.9	42.6	63.2
Los Angeles, Cal	59.2	60.1	62.0	63.8	66.8	70.0	74.9	76.3	71.0	67.3	64.8	56.8	66.0
Mammoth Tank, Cal	54.7	59.0	58.9	68.8	85.0	92.9	99.8	100.1	89.9	80.3	66.9	54.5	75.1
Maricopa, Ariz	48.0	55.8	59.5	68.1	81.9	89.6	93.7	89.9	79.5	71.9	59.3	55.9	71.1
Martinez, Cal	43.8	44.4	54.1	54.8	61.2	63.6	66.6	65.7	59.5	55.5	51.4	47.0	56.2
Marysville, Cal	43.7	48.0	55.8	67.0	69.1	70.8	76.9	82.4	80.2	67.2	55.9	49.2	63.8
Menlo Park, Cal	46.4	48.1	58.2	57.2	65.6	65.8	69.8	66.0	59.6	(1)	53.3	48.3	.....
Merced, Cal	47.4	48.9	51.5	59.7	66.4	70.6	77.6	79.0	62.0	63.0	59.9	50.3	61.4
Modesto, Cal	40.4	46.4	52.2	56.2	65.5	67.6	80.7	(1)	69.4	64.6	62.2	46.0	.....
Mejave, Cal	45.8	45.2	52.2	51.8	55.3	60.2	77.0	76.8	(1)	73.4	(1)	(1)	.....
Monterey, Cal	50.1	50.6	55.9	57.9	60.8	62.5	62.6	62.4	59.3	57.5	53.4	51.5	57.0
Napa, Cal	48.8	52.0	52.8	51.8	68.2	69.2	66.7	67.0	(1)	55.2	53.5	48.6	.....
Needles, Ariz	51.7	53.8	60.7	68.8	77.8	80.3	98.7	89.2	78.2	(2)			.....
Newhall, Cal	48.4	48.9	51.4	46.0	62.9	68.1	73.3	76.8	65.7	60.5	56.5	47.3	58.8
Niles, Cal	46.6	49.2	53.1	54.3	60.9	62.5	68.4	67.8	65.0	57.4	51.0	48.1	57.0
Oakland, Cal	49.0	49.2	53.4	55.5	58.0	60.8	61.5	58.9	58.8	56.5	54.8	51.2	55.6
Ogden, Utah	24.4	28.4	41.4	50.7	64.3	75.9	78.8	77.2	61.3	51.6	39.5	34.9	52.4
Orland, Cal	49.2	50.1	55.4	59.4	72.4	78.3	84.7	85.4	72.8	67.4	59.1	52.7	65.2
Otego, Nev	19.6	19.8	33.0	44.9	54.9	64.9	72.5	72.9	58.8	45.2	37.9	25.4	45.8
Pajaro, Cal	48.8	52.9	52.8	54.6	60.3	62.7	63.0	64.0	59.4	56.1	54.0	49.2	56.5
Palisades, Nev	24.6	20.0	38.2	47.2	63.3	72.9	77.8	78.9	55.4	41.4	29.1	28.0	47.6
Pantano, Ariz	49.4	51.1	55.0	56.2	66.1	(1)	86.3	80.8	75.7	68.5	60.4	52.0	.....
Petaluma, Cal	45.8	47.7	53.0	55.6	62.1	63.0	65.5	66.0	62.8	(1)	55.4	51.8	.....
Pleasanton, Cal	44.6	46.0	51.1	57.6	63.7	63.7	78.6	75.8	68.2	65.5	60.5	49.9	60.0
Promontory, Utah	21.5	22.9	37.6	46.9	58.4	72.5	79.8	71.6	61.8	52.3	(1)	26.1	.....
Ravenna, Cal	46.0	45.9	48.5	54.4	63.0	65.8	73.2	80.5	67.5	59.7	58.0	47.0	58.7
Red Bluff, Cal	45.4	45.2	50.7	55.6	69.6	71.8	81.1	85.1	70.0	65.7	58.4	48.6	62.2
Redding, Cal	(1)	(1)	(1)	59.9	63.9	67.8	70.3	(1)	72.6	65.6	59.1	44.9	.....
Reno, Nev	27.5	25.7	37.1	41.9	54.5	62.3	69.3	68.7	53.4	47.4	41.8	35.4	47.1
Rocklin, Cal	48.6	47.3	53.0	57.6	66.9	69.2	75.8	81.3	(1)	58.6	(1)	45.9	....
Sacramento, Cal	46.7	47.9	54.3	59.9	68.6	70.4	75.1	75.2	65.3	59.8	54.7	48.6	60.5
Salinas, Cal	46.4	49.3	53.9	56.4	63.3	68.9	63.4	63.1	61.4	58.9	52.7	49.0	56.8
San Fernando, Cal	52.7	52.9	53.6	57.8	63.1	(1)	72.4	75.0	67.9	62.4	60.3	50.4	.....
San José, Cal	47.8	48.6	52.6	55.2	62.3	61.6	65.4	65.6	62.0	(1)	54.5	51.7	.....
San Mateo, Cal	44.8	45.8	50.8	53.0	59.2	60.8	64.3	60.2	59.8	54.1	52.5	48.9	54.5
San Simon, Ariz	45.6	51.7	58.7	62.7	78.5	81.8	88.4	81.3	78.3	71.3	61.0	46.5	66.7
Santa Cruz, Cal	52.5	53.4	55.7	57.7	62.6	63.9	65.1	66.1	62.6	60.1	56.3	54.0	59.2
Soledad, Cal	45.4	49.7	53.2	58.4	65.8	65.9	65.8	66.2	60.3	57.5	51.0	45.9	57.2
Sequel, Cal	55.5	50.9	53.5	54.4	63.6	69.9	65.9	(1)	62.8	56.3	55.3	49.3	.....
South Vallejo, Cal	54.4	52.2	56.4	63.2	65.6	66.7	70.0	66.9	(1)	63.0	61.0	54.2	.....
Spadra, Cal	58.2	54.8	56.2	62.0	65.4	70.7	72.5	77.5	70.7	62.9	61.1	58.5	63.8
Stockton, Cal	46.4	45.9	53.1	57.8	63.1	64.1	69.9	78.7	63.0	59.4	54.7	48.6	58.3
Suisun, Cal	37.4	50.5	56.2	59.6	65.6	66.5	73.0	72.7	68.3	63.2	55.4	50.1	59.0
Summit, Cal	26.3	25.1	29.5	31.6	39.7	44.2	53.9	57.2	45.7	42.2	38.6	28.1	38.5
Sumner, Cal	51.2	57.8	56.8	59.6	67.7	76.1	81.8	87.1	73.1	61.6	58.0	49.4	65.0
Tecoma, Nev	15.1	20.2	38.3	44.8	59.9	65.2	70.7	69.9	48.4	48.7	(1)	31.3	.....
Tehama, Cal	45.8	47.0	54.2	56.1	(1)	68.9	78.6	78.8	(1)	66.6	62.0	46.7	.
Tehichipa, Cal	41.9	39.3	44.0	48.4	55.8	59.6	65.0	71.7	60.1	58.4	51.5	38.8	52.8
Tennant, Cal	49.3	50.1	52.7	56.4	64.3	64.8	69.4	72.5	64.0	61.9	58.6	48.4	59.4
Terrace, Utah	25.3	25.6	40.7	47.0	67.0	70.1	78.4	74.4	52.0	(1)	40.9	30.9	.. ..
Texas Hill, Ariz	52.5	57.5	62.3	69.4	80.2	88.9	96.9	93.6	84.7	73.8	61.2	51.6	72.7
Toano, Nev	21.4	22.4	35.4	42.2	52.0	60.8	68.1	69.5	51.4	48.4	38.8	24.4	44.6
Tracy, Cal	47.6	50.7	56.2	61.3	70.2	74.2	81.1	82.1	71.4	65.7	55.4	48.2	63.7
Truckee, Cal	25.6	21.9	30.6	39.7	50.8	56.0	63.2	65.6	(1)	44.1	37.3	28.1	.....
Tucson, Ariz	49.7	63.0	65.2	71.8	75.5	85.8	92.4	85.2	83.4	74.7	64.4	54.2	72.1
Tulare, Cal	46.8	53.0	54.6	60.8	70.7	74.7	81.4	83.4	70.9	62.6	56.8	47.5	63.4
Turlock, Cal	47.0	50.8	55.1	69.1	75.4	75.3	83.8	82.1	68.2	58.6	52.8	50.7	64.0
Wadsworth, Nev	33.6	32.6	44.3	52.7	65.2	68.9	78.4	74.1	62.9	52.3	45.3	37.5	54.0
Wells, Nev	20.0	19.9	33.4	42.0	53.4	60.1	67.9	68.6	52.6	44.3	32.3	27.2	43.5
Willcox, Ariz	42.3	49.8	51.3	59.5	67.8	76.8	85.4	79.2	73.0	64.5	52.1	43.2	62.0
Williams, Cal	46.9	47.2	52.6	58.7	71.2	69.9	77.7	80.6	69.2	64.0	57.7	46.1	61.8
Willow, Cal	47.4	46.0	58.9	53.2	64.7	76.9	78.2	79.6	68.1	62.4	57.2	45.8	61.5
Winnemucca, Nev	23.4	20.2	38.0	48.8	63.9	72.3	83.8	83.1	58.0	48.8	43.4	34.4	51.5
Woodland, Cal	46.6	45.6	54.2	56.1	66.5	69.3	79.2	80.4	72.0	(1)	59.0	51.1	.....
Yuma, Ariz	56.6	58.9	60.9	67.4	77.9	(1)	94.5	92.1	(1)	73.3	68.7	55.8	.....

[1] No record.

[2] Observations discontinued.

APPENDIX 21.

Monthly maximum and minimum temperatures, in degrees Fahrenheit, and annual range of branches, for the year end

[From self-regis

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Alta, Cal	60	30	70	16	60	28	68	30	80	46	86	44
Anaheim, Cal	72	42	89	40	90	36	80	50	92	54	90	54
Antioch, Cal	60	26	68	22	72	34	72	38	84	50	85	52
Aptos, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Auburn, Cal	66	31	73	20	70	33	78	40	84	50	88	50
Battle Mountain, Nev	50	8	53	—30	65	24	72	30	85	42	90	50
Benson, Ariz	67	20	78	30	78	38	84	48	91	54	(1)	( )
Beowawe, Nev	42	—19	50	—23	54	22	72	33	80	37	87	50
Bishop's Creek, Nev	(1)	(1)	(1)	(1)	63	32	85	35	90	45	85	63
Blue Creek, Utah	48	7	49	—15	54	25	60	34	84	33	92	42
Boca, Cal	50	—14	45	—39	45	2	55	20	68	30	80	40
Borden, Cal	80	26	97	28	101	34	94	40	104	45	102	45
Brentwood, Cal	61	28	67	22	76	35	71	42	84	49	90	53
Brighton, Cal	71	30	74	25	80	41	80	47	92	55	95	55
Brown's, Nev	51	10	58	—16	62	28	74	34	95	52	96	54
Byron, Cal	62	30	74	26	76	40	76	42	90	50	94	56
Cabazon, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Caliente, Cal	70	31	70	28	74	32	70	42	90	50	94	50
Calistoga, Cal	79	26	76	17	75	31	75	40	90	51	92	55
Carlin, Nev	44	—22	44	—34	54	20	66	30	80	34	90	44
Casa Grande, Ariz	70	32	78	28	75	45	88	52	102	56	113	68
Chico, Cal	60	30	78	20	76	34	85	48	85	56	97	54
Chualar, Cal	70	26	85	31	70	37	80	40	98	40	80	40
Cisco, Cal	44	16	44	Zero.	44	16	42	25	53	32	76	35
Colfax, Cal	62	34	75	22	68	33	72	36	86	40	90	46
Colton, Cal	74	31	93	30	90	44	80	43	92	48	103	48
Corinne, Utah	49	— 3	53	—15	57	24	76	34	84	39	98	56
Daggett, Cal	70	20	70	20	70	32	80	38	89	53	99	62
Davis, Cal	62	27	86	28	88	42	86	46	96	49	98	52
Delano, Cal	62	28	60	36	56	40	74	46	(2)	(2)	97	(2)
Delta, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Deming, N. Mex	60	20	60	25	81	44	75	50	89	50	98	61
Dunnigan, Cal	69	30	82	30	90	37	88	41	92	57	92	48
Elko, Nev	48	—25	50	—35	57	15	70	31	88	39	90	50
El Paso, Tex	65	8	72	20	78	28	90	30	100	35	(1)	(1)
Emigrant Gap, Cal	51	26	60	6	60	22	58	29	66	40	78	38
Farmington, Cal	60	27	68	22	69	40	79	46	90	57	94	55
Fenner, Cal	67	29	79	22	71	40	87	45	98	50	112	65
Fresno, Cal	66	30	72	29	76	38	81	46	95	52	102	50
Galt, Cal	65	30	68	22	72	40	77	45	90	50	93	57
Gilroy, Cal	68	23	75	28	75	40	78	43	88	50	93	53
Golconda, Nev	55	— 6	71	—17	75	31	80	37	91	45	(1)	(1)
Goshen, Cal	70	20	78	37	78	38	84	40	98	50	103	50
Halleck, Nev	40	—35	52	—45	58	8	64	28	79	39	88	39
Hawthorne, Nev	(1)	(1)	(1)	(1)	68	36	78	40	91	54	92	56
Hollister, Cal	64	30	78	28	78	37	80	37	89	52	90	53
Hotel del Monte, Cal	64	31	74	28	70	40	71	45	78	50	69	56
Hot Springs, Nev	50	2	58	—32	64	26	75	30	90	32	96	32
Humboldt, Nev	52	1	70	—22	65	20	57	39	72	45	93	50
Indio, Cal	78	32	88	32	81	49	96	51	108	60	106	65
Ione, Cal	88	29	81	25	89	38	90	46	94	50	99	40
Keeler, Cal	(1)	(1)	(1)	(1)	(1)	(1)	86	50	98	54	105	60
Keene, Cal	58	22	72	16	65	28	75	30	86	41	88	41
Kelton, Utah	46	— 8	54	—20	54	24	68	(1)	88	40	92	52
Kingsburg, Cal	82	33	90	32	90	39	90	43	98	50	95	61
Knight's Landing, Cal	68	30	75	25	70	40	79	48	86	54	87	56
Lathrop, Cal	60	27	55	36	70	38	76	46	84	52	87	52
Lemoore, Cal	73	30	64	26	66	34	84	44	95	52	95	52
Livermore, Cal	70	28	84	26	76	32	78	42	85	47	88	53
Lordsburg, N. Mex	65	8	80	20	78	30	84	42	95	55	105	70
Los Angeles, Cal	86	43	89	45	81	46	78	54	78	53	95	58
Mammoth Tank, Cal	74	33	85	30	86	48	101	52	113	62	128	73

[1] No record. [2] Record incomplete. [3] Observations discontinued.

APPENDIX 21.

temperature, at stations on the Central Pacific and Southern Pacific Railroads, and connecting ing December 31, 1884.

tering thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
90	50	90	50	86	40	80	34	78	40	70	20	74
92	63	96	60	96	50	100	48	87	40	70	36	64
96	56	94	38	90	50	86	40	78	34	68	20	76
80	48	76	52	74	45	70	40	75	37	70	25	....
95	54	98	56	93	48	82	40	76	39	71	28	78
95	60	99	58	88	38	78	28	66	16	54	— 1	129
108	70	102	70	98	58	89	48	78	36	74	30	....
94	55	98	60	96	40	78	25	68	15	57	— 8	121
100	75	95	70	80	50	79	42	70	24	63	20	....
96	30	93	59	82	30	74	30	60	28	46	6	113
92	38	92	40	90	30	75	21	70	11	60	—10	131
112	50	114	54	108	50	88	48	76	32	76	23	91
95	60	100	65	93	53	90	54	78	39	67	28	78
90	66	105	57	101	52	99	45	85	33	72	22	83
100	54	100	70	98	46	78	36	64	24	62	6	116
100	64	105	62	92	54	80	48	74	48	68	26	79
(1)	(1)	104	62	90	52	90	50	82	46	76	30	....
100	60	100	62	98	50	90	40	70	30	60	32	72
98	55	100	55	92	42	87	40	78	31	78	19	83
94	48	92	48	66	32	76	24	68	8	50	—12	128
118	85	108	73	100	65	98	53	86	48	72	34	90
105	67	111	65	95	50	78	48	75	35	74	25	91
92	45	90	40	90	40	90	37	90	37	70	20	78
78	40	79	24	79	30	69	25	56	24	49	8	79
94	52	97	58	91	48	86	40	76	40	75	26	75
103	48	110	50	98	50	92	40	82	36	68	30	80
95	60	95	56	90	42	78	30	62	22	48	8	110
104	70	104	64	(1)	(1)	(3)	(3)	....	....	....	....	....
108	62	110	68	106	54	92	44	87	31	88	25	85
102	65	101	63	98	53	88	48	78	42	79	42	....
(1)	(1)	(1)	(1)	(1)	(1)	70	42	64	36	65	22	....
106	70	95	70	94	60	85	48	74	45	75	20	86
98	60	103	60	96	56	80	48	73	36	62	22	81
98	51	97	47	90	28	75	18	68	8	57	—15	133
(1)	(1)	102	70	(1)	(1)	88	40	70	28	74	28	....
82	48	86	48	80	37	71	30	66	32	64	18	80
104	64	108	61	100	51	86	44	76	38	69	23	86
112	70	(1)	(1)	102	64	(3)	(3)	....	....	....	....	....
108	62	(1)	(1)	95	53	89	51	80	36	70	32	....
100	68	104	62	89	51	81	40	76	32	67	25	82
102	53	96	53	90	50	90	45	76	35	72	18	84
100	58	105	60	98	41	88	32	80	19	80	2	....
106	70	107	65	99	60	90	46	82	32	70	21	87
90	42	101	37	(1)	(1)	80	34	86	8	78	—18	....
96	65	98	70	82	48	80	38	75	30	70	10	....
96	54	98	53	90	50	83	46	78	37	72	26	72
74	53	77	50	77	44	77	40	71	40	68	30	50
95	32	99	52	90	38	60	28	70	14	60	—10	131
90	48	(1)	(1)	68	38	54	26	53	16	58	—10	....
112	82	112	74	104	58	97	52	91	40	88	28	84
100	50	106	50	100	50	90	48	84	31	77	20	86
107	84	108	76	104	68	94	48	78	42	56	30	....
94	55	98	46	86	38	82	30	75	30	70	12	86
98	58	100	54	84	40	(1)	(1)	61	20	60	5	....
105	65	106	60	100	52	80	48	82	46	72	25	81
101	60	(1)	(1)	96	54	83	42	84	36	80	26	....
96	55	(1)	(1)	85	45	82	44	72	50	67	22	....
101	70	107	70	(1)	(1)	78	50	74	34	65	20	....
100	54	100	51	95	49	93	42	82	36	89	28	74
110	70	102	70	92	60	86	40	68	38	65	22	102
91	65	96	62	95	60	95	54	92	46	83	35	61
120	78	128	85	115	70	105	53	96	54	84	40	98

Monthly maximum and minimum temperatures and annual range of temperature at

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°
Maricopa, Ariz	72	14	67	40	76	46	89	40	100	60	115	72
Martinez, Cal	65	28	65	26	68	40	73	44	80	50	80	52
Marysville, Cal	60	30	79	25	75	38	89	49	90	51	94	52
Menlo Park, Cal	60	28	74	24	72	36	76	45	86	54	80	56
Merced, Cal	66	28	70	26	72	38	80	44	88	50	96	48
Modesto, Cal	65	30	71	29	73	39	81	49	91	50	95	50
Mojave, Cal	86	26	73	20	80	30	85	29	82	30	90	40
Monterey, Cal	66	30	74	25	72	37	72	42	79	52	70	56
Napa, Cal	71	23	74	18	69	32	81	41	85	47	94	52
Needles, Ariz	67	32	78	26	76	44	90	50	100	57	110	68
Newhall, Cal	76	22	79	28	70	32	80	40	82	45	102	51
Niles, Cal	65	32	75	32	73	40	72	41	92	43	87	51
Oakland, Cal	58	38	72	32	68	44	70	44	72	49	76	54
Ogden, Utah	52	— 6	54	—24	60	26	82	34	90	35	100	50
Orland, Cal	70	34	78	26	78	30	84	44	98	56	98	54
Otego, Nev	42	—10	44	—22	46	10	64	32	74	32	88	44
Pajaro, Cal	70	35	80	32	78	32	76	36	88	50	80	54
Palisade, Nev	46	— 6	49	—30	56	20	76	30	88	35	94	46
Pantano, Ariz	85	34	74	35	80	37	77	45	90	40	(1)	(1)
Petaluma, Cal	62	24	78	22	73	38	78	46	94	50	82	52
Pleasanton, Cal	68	23	70	22	78	34	79	41	92	50	85	47
Promontory, Utah	48	— 7	55	—32	55	22	75	35	88	31	100	45
Ravenna, Cal	64	20	74	26	68	32	78	38	92	50	100	50
Red Bluff, Cal	78	30	76	26	74	36	76	46	90	48	96	58
Redding, Cal	(1)	(1)	(1)	(1)	(1)	(1)	75	50	76	50	90	57
Reno, Nev	49	2	50	—14	60	22	59	32	76	36	84	44
Rocklin, Cal	64	30	75	22	70	39	74	44	88	53	90	57
Sacramento, Cal	58	33	70	26	70	39	75	50	85	56	89	57
Sa inas, Cal	62	30	65	27	68	40	68	46	80	52	78	56
San Fernando, Cal	71	30	86	35	70	40	76	42	88	55	(1)	(1)
San José, Cal	70	30	71	28	72	39	71	44	81	48	80	52
San Mateo, Cal	59	31	68	28	65	38	68	48	80	50	74	54
San Simon, Ariz	69	20	74	20	78	32	82	48	94	48	102	64
Santa Cruz, Cal	68	36	76	32	79	38	79	41	80	51	82	58
Soledad, Cal	66	26	76	26	80	34	78	44	90	50	84	54
Soquel, Cal	78	38	76	28	74	38	70	40	82	50	88	50
South Vallejo, Cal	75	39	70	35	71	47	74	46	88	53	82	55
Spadra, Cal	68	30	98	32	80	43	87	46	91	50	96	56
Stockton, Cal	60	32	65	26	62	40	71	46	80	52	84	54
Suisun, Cal	62	18	78	26	80	39	84	46	94	50	88	56
Summit, Cal	36	16	48	— 7	45	11	42	20	50	30	60	32
Sumner, Cal	73	37	76	40	80	39	70	52	94	50	98	56
Tecoma, Nev	45	—15	55	—26	60	20	68	26	82	32	90	45
Tehama, Cal	60	32	80	30	72	36	78	42	(1)	(1)	100	50
Tehichipa, Cal	58	20	60	9	60	28	64	30	79	35	81	47
Tennant, Cal	66	28	79	25	73	34	79	40	86	48	84	48
Terrace, Utah	50	— 4	60	—20	61	22	62	34	92	50	93	54
Texas Hill, Ariz	74	28	88	30	85	49	98	50	108	56	118	67
Toano, Nev	46	—18	50	—22	52	28	62	30	74	35	88	38
Tracy, Cal	64	28	76	28	30	40	80	46	90	56	97	56
Truckee, Cal	50	— 1	44	—26	47	8	58	28	72	32	81	42
Tucson, Ariz	79	31	88	41	86	45	90	56	98	51	109	70
Tulare, Cal	65	31	72	32	71	41	96	50	98	58	100	60
Turlock, Cal	72	25	79	23	82	32	94	42	96	58	94	53
Wadsworth, Nev	58	8	60	—10	64	28	72	40	84	50	94	50
Wells, Nev	46	—12	42	—22	50	12	62	22	78	32	82	34
Willcox, Ariz	72	10	85	22	80	27	81	39	92	44	104	58
Williams, Cal	64	33	80	26	78	34	76	48	95	58	93	56
Willow, Cal	62	32	67	32	81	35	79	36	90	40	107	43
Winnemucca, Nev	50	— 5	48	—27	65	22	78	30	97	44	99	50
Woodland, Cal	66	30	72	29	69	30	74	46	85	56	94	58
Yuma, Ariz	69	44	82	37	81	43	95	45	98	63	(1)	(2)

[1] No record.

[2] Record incomplete.

Stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

July.		August.		September.		October.		November.		December.	
ax.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
°	°	°	°	°	°	°	°	°	°	°	°
112	71	108	72	99	59	98	46	84	37	82	30
99	58	88	58	88	40	70	44	68	40	60	32
101	61	108	50	100	57	91	48	80	35	80	26
98	56	89	58	82	44	(1)	(1)	70	35	64	24
106	56	104	58	94	48	86	42	84	38	80	24
108	61	(1)	(1)	98	50	90	45	90	39	70	25
99	50	100	51	(1)	(1)	97	54	(1)	(1)	(1)	(1)
99	54	77	58	77	50	81	40	72	39	69	29
106	50	96	50	(1)	(1)	81	38	75	30	67	18
114	76	106	74	98	62	(2)	(2)	......	......	......	......
106	54	107	58	99	50	92	40	86	35	84	26
97	54	98	52	89	54	86	48	74	40	65	30
74	54	71	54	70	48	68	42	66	42	68	32
98	55	106	55	95	42	80	30	62	22	52	10
106	66	110	68	102	54	90	54	80	40	72	32
92	54	90	56	82	28	66	30	62	18	58	—14
82	52	81	55	83	39	87	32	80	37	80	25
106	50	90	60	90	31	60	22	58	9	56	—20
106	74	106	65	104	60	98	50	82	47	76	35
98	55	98	42	90	46	(1)	(1)	74	36	72	24
98	59	99	58	94	52	85	45	78	34	68	20
105	60	106	54	96	43	72	30	(1)	(1)	49	— 6
106	52	106	52	102	48	84	37	78	30	78	30
101	62	112	62	100	54	95	51	86	42	74	26
102	48	(1)	(1)	91	60	85	50	79	42	69	28
96	55	98	58	84	34	68	26	64	29	57	10
96	60	104	57	(1)	(1)	80	43	(1)	(1)	64	25
96	62	97	60	89	54	77	45	78	39	65	30
98	54	74	55	84	52	84	40	68	42	72	26
91	62	104	54	98	50	91	45	89	45	82	31
94	52	90	53	84	48	(1)	(1)	72	37	72	30
98	55	76	51	78	50	76	43	68	39	64	28
[illegible]	76	101	65	95	60	90	52	86	42	72	30
[illegible]	53	91	52	88	48	85	44	80	44	74	34
[illegible]	54	94	50	80	40	91	42	78	36	76	22
[illegible]	52	(1)	(1)	82	44	76	42	74	30	70	26
[illegible]	58	96	57	(2)	(2)	84	50	76	43	69	32
[illegible]	56	108	58	98	55	98	44	82	49	88	32
[illegible]	56	98	56	88	46	80	46	76	38	65	30
[illegible]	58	98	57	92	54	90	40	78	38	70	20
[illegible]	38	72	45	70	32	57	26	58	24	54	8
[illegible]	59	108	70	96	54	80	40	78	40	76	30
[illegible]	40	97	48	88	35	74	27	(1)	(1)	56	— 5
[illegible]	52	110	60	(1)	(1)	88	50	80	38	62	22
[illegible]	50	92	54	88	38	78	38	75	26	68	18
[illegible]	54	96	55	88	46	91	40	82	34	78	18
[illegible]	64	93	59	79	39	(1)	(1)	60	26	47	9
[illegible]	76	120	71	113	62	104	48	90	37	80	30
[illegible]	40	90	48	75	36	71	31	60	20	42	—18
[illegible]	60	106	60	96	54	90	46	78	34	70	25
[illegible]	43	87	48	(1)	(1)	68	28	64	18	56	— 7
[illegible]	80	107	78	103	70	86	66	79	50	75	39
[illegible]	64	108	64	100	54	90	46	84	38	72	34
[illegible]	61	111	55	100	48	81	43	79	35	80	20
[illegible]	62	100	60	92	44	76	30	68	20	62	Zero.
[illegible]	46	88	40	82	30	74	28	69	14	50	—14
[illegible]	72	97	66	94	53	87	40	90	29	70	23
[illegible]	65	109	64	94	48	85	44	92	34	65	25
[illegible]	68	100	65	89	58	79	48	76	39	70	25
[illegible]	70	104	70	84	40	76	22	67	12	57	Zero.
[illegible]	62	104	60	99	53	(1)	(1)	79	37	71	36
[illegible]	84	106	76	(1)	(1)	97	58	87	40	80	43

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[2] Observations discontinued.

APPENDIX 22.

Mean of the maximum and minimum temperatures (in degrees Fahrenheit) at the cotton-region stations of the Signal Service, United States Army, for the months July to October, 1884, *and May and June,* 1885.

[These means are obtained by dividing the sums of the daily readings of self-registering thermometers by the number of observations taken—one daily at 5 p. m., central time.]

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Wilmington, N. C.:	°	°	°	°	°	°	°	°	°	°	°	°
Charlotte, N. C	86.5	68.5	84.5	66.5	81.9	64.4	76.4	57.8	76.8	58.5	84.2	67.4
Cheraw, S. C	93.2	67.8	90.0	65.2	86.9	60.0	[1]85.1	[2]53.7	83.8	58.3	89.8	66.4
Florence, S. C	91.2	69.7	90.5	68.0	86.9	63.1	82.1	56.3	82.6	59.9	89.7	68.1
Goldsborough, N. C	89.6	71.5	86.5	68.0	84.7	62.3	80.5	57.1	78.2	58.0	86.1	66.9
Lumberton, N. C	90.4	69.3	88.8	66.9	82.5	60.3	79.7	54.3	80.8	56.8	86.7	66.1
New-Berne, N. C	88.5	69.2	85.6	67.1	87.5	64.9	76.6	54.9	79.9	57.8	87.1	65.4
Raleigh, N. C	89.5	67.9	86.2	66.4	85.1	61.1	78.0	[3]54.4	79.3	56.3	88.3	64.3
Salisbury, N. C	92.3	63.3	89.5	61.8	89.1	58.4	81.3	49.6	80.9	41.7	90.7	51.6
Wadesborough, N. C	91.5	68.6	88.8	65.9	86.5	62.2	82.5	55.6	81.7	49.3	90.0	58.2
Weldon, N. C	88.4	68.1	86.1	67.0	85.1	61.5	77.7	52.2	76.7	58.3	86.6	65.0
Wilmington, N. C	87.4	73.5	84.6	70.5	88.9	67.5	77.7	60.5	79.0	62.9	84.6	66.0
Charleston, S. C.:												
Branchville, S. C	90.9	71.9	87.8	69.0	84.9	65.5	80.4	56.8	82.8	60.0	89.2	68.3
Charleston, S. C	88.9	76.4	85.2	72.7	88.1	71.7	78.0	65.8	79.9	66.4	86.8	73.6
Hardeeville, S. C	93.7	70.6	89.6	68.7	86.8	65.3	82.4	56.8	84.5	58.7	90.8	69.1
Jacksonborough, S. C	[2]91.6	[2]75.4	88.6	71.3	[4]85.4	[4]62.8	80.7	55.6	77.4	55.1	88.7	63.5
Kingstree, S. C	[2]92.1	[2]69.3	[4]89.5	[4]67.3	[5]86.0	[5]62.1	[4]80.6	[4]51.4	[4]82.7	[4]57.3	88.9	64.0
Saint George's, S. C	93.1	68.8	89.9	66.5	85.8	63.1	81.6	55.1	84.9	55.7	91.4	64.2
Saint Matthew's, S. C	91.4	71.4	88.5	68.9	85.2	64.9	[6]81.6	[6]58.4	[3]83.2	[3]59.0	90.1	68.1
Yemassee, S. C	92.0	70.8	89.0	68.4	85.7	64.4	81.1	54.5	83.8	58.4	89.8	67.8
Augusta, Ga.:												
Allendale, S. C	91.0	63.6	88.8	61.9	85.0	64.8	81.5	60.1	82.9	60.3	89.2	68.5
Athens, Ga	96.0	69.7	92.2	66.2	[3]87.8	[3]60.1	80.0	50.9	84.6	56.4	94.2	65.6
Augusta, Ga	89.9	72.9	88.3	70.9	85.3	68.2	81.3	61.2	88.0	60.5	91.0	68.7
Batesburg, S. C	91.8	70.4	89.7	67.3	86.3	64.7	81.4	58.2	82.8	[4]60.4	91.4	67.2
Blackville, S. C	92.9	73.0	89.1	68.9	85.5	63.9	81.7	56.8	82.8	58.2	89.9	66.9
Camak, Ga	94.9	69.6	92.8	66.6	90.7	66.5	85.7	58.0	84.2	55.3	92.0	65.2
Chester, S. C	92.2	69.6	88.4	66.5	86.2	62.8	83.1	56.1	82.8	58.0	90.3	67.0
Columbia, S. C	90.4	69.5	88.0	68.0	[6]85.0	[6]64.2	81.2	56.6	80.0	60.2	88.0	68.3
Greenwood, S. C	89.4	67.9	86.6	64.5	85.0	59.7	80.8	56.9	80.3	57.7	89.0	67.0
Union Point, Ga	......	......	......	......	......	......	......	......	[4]77.5	[1]54.9	85.7	63.8
Washington, Ga	95.5	69.2	93.4	67.0	93.3	64.3	88.0	57.2	88.5	58.4	91.7	67.8
Waynesborough, Ga	[2]95.0	[2]71.0	89.2	59.2	85.6	54.3	81.5	46.7	88.8	60.1	91.4	68.3
Savannah, Ga.:												
Albany, Ga	91.5	73.2	91.1	71.0	90.0	68.0	86.4	59.7	84.8	68.1	91.7	72.4
Allapaha, Ga	91.7	72.9	[3]86.4	[3]67.1	[3]87.7	[3]66.0	[3]83.8	[3]58.1	[3]80.6	[3]57.9	[6]90.3	[6]67.9
Bainbridge, Ga	90.3	72.5	90.6	70.2	90.2	67.7	85.5	58.4	83.6	65.1	90.5	70.8
Cedar Keys, Fla	87.5	76.8	88.1	74.4	86.9	73.6	82.1	67.2	81.7	69.9	87.5	76.5
Eastman, Ga	[8]92.8	([7])	[8]90.8	([7])	[8]89.7	([7])	[9]84.1	([7])	83.9	59.0	91.9	68.9
Fernandina, Fla	91.6	71.7	87.9	72.3	([7])	([7])	89.3	73.0	80.1	67.4	86.5	73.0
Fort Gaines, Ga	91.0	72.2	90.0	68.4	90.8	66.3	[3]86.0	[3]57.4	84.5	59.9	92.4	69.2
Jesup, Ga	94.5	71.2	91.1	69.7	87.6	66.6	82.4	58.9	85.0	60.5	[6]92.7	[6]69.3
Live Oak, Fla	94.3	69.7	92.0	67.3	[6]89.9	[6]64.0	[3]85.6	[3]56.6	86.0	60.6	92.0	69.9
Millen, Ga	94.1	69.2	91.8	68.0	87.9	63.4	84.6	55.7	85.5	59.5	92.1	67.3
Quitman, Ga	92.6	72.7	[2]91.5	[2]66.4	89.9	66.8	[3]85.5	[3]58.6	86.4	61.3	94.1	69.6
Savannah, Ga	89.8	76.0	[5]86.2	[5]73.1	83.1	70.4	78.2	63.8	80.9	66.2	86.7	72.8
Smithville, Ga	94.1	68.0	95.0	67.9	90.3	64.1	85.6	54.1	87.7	61.8	95.1	69.5
Thomasville, Ga	89.4	72.8	89.0	69.2	88.2	67.4	85.2	59.7	83.3	61.3	90.3	68.2
Waldo, Fla	89.2	72.7	90.7	70.4	([7])	([7])	85.9	63.8	87.1	58.3	91.6	70.7
Way Cross, Ga	95.9	70.9	94.5	72.6	90.5	63.2	88.7	64.7	83.5	61.9	91.5	70.4
Atlanta, Ga.:												
Anderson, S. C	93.8	68.8	91.4	66.7	89.4	63.1	82.5	56.0	83.2	55.2	92.4	65.8
Atlanta, Ga	85.0	70.6	83.1	67.5	83.6	66.1	77.1	59.5	74.8	59.0	84.0	69.3
Cartersville, Ga	91.7	67.9	88.9	65.1	88.7	63.7	81.0	54.8	77.1	58.3	[6]90.2	65.7
Columbus, Ga	[4]89.6	[4]69.2	[5]83.4	[5]70.4	[5]89.6	[5]68.2	[4]84.8	[4]58.5	[4]76.5	[4]60.3	[5]86.0	[5]69.6

[1] Twenty-two days only.
[2] Thirty days only.
[3] Twenty-eight days only.
[4] Twenty-seven days only.
[5] Twenty-six days only.
[6] Twenty-nine days only.
[7] No record.
[8] Twenty-five days only.
[9] Twenty-three days only.

Mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Atlanta, Ga.—Continued:	°	°	°	°	°	°	°	°	°	°	°	°
Dalton, Ga	88.7	69.0	87.2	65.0	88.3	63.6	80.1	54.8	80.0	[1]58.6	92.5	65.1
Gainesville, Ga	83.5	67.2	85.0	65.8	84.7	57.4	77.5	52.2	[2]79.0	[2]53.5	88.4	63.4
Greenville, S. C	91.7	67.1	87.8	64.9	85.8	61.0	79.6	58.5	81.1	52.5	91.2	64.9
Griffin, Ga	88.5	70.9	86.1	67.4	86.1	66.4	80.5	59.0	78.5	59.3	86.7	68.8
Macon, Ga	93.3	71.7	90.0	69.3	89.2	66.2	88.9	58.1	83.3	59.8	91.7	69.6
Newnan, Ga	91.3	70.6	88.4	66.9	[2]88.6	65.0	82.1	58.1	81.4	58.4	89.9	67.3
Spartanburg, S. C	92.1	67.4	89.5	65.1	89.0	60.8	[3]83.6	[3]52.8	83.2	[4]50.9	89.6	65.9
Toccoa, Ga	90.5	66.8	88.0	64.1	86.7	61.0	79.3	52.6	80.5	54.4	89.7	64.2
West Point, Ga	92.0	71.1	89.5	67.5	89.7	66.0	83.2	56.8	80.3	65.7	89.0	68.1
Montgomery, Ala.:												
Birmingham, Ala	91.3	68.8	89.9	65.9	93.6	69.3	88.1	67.2	80.4	52.0	90.6	61.7
Calera, Ala	[2]92.3	[2]62.4	[2]93.2	[2]62.4	90.3	59.3	82.8	48.9	[4]85.6	[4]54.3	[1]95.8	[1]65.0
Eufaula, Ala	91.1	72.1	89.6	69.6	96.2	71.3	85.2	[4]56.5	[2]90.0	[2]60.1	90.4	69.2
Fort Deposit, Ala	[2]90.4	[2]70.6	88.3	66.2	88.9	64.1	82.7	56.6	81.3	71.0	89.4	71.2
Greenville, Ala	(6)	(6)	89.3	63.8	90.5	68.6	83.2	58.2	82.0	74.3	89.5	79.0
Marion, Ala	95.1	72.9	93.2	67.5	94.0	65.9	84.0	57.0	86.4	56.6	96.8	66.2
Montgomery, Ala	90.9	72.9	88.8	69.5	89.4	68.6	83.0	61.4	80.8	61.5	90.6	70.4
Opelika, Ala	92.1	69.7	90.0	64.9	88.0	65.0	82.8	55.8	80.6	58.4	89.2	67.4
Pine Apple, Ala	93.1	70.0	[2]87.1	[2]63.4	90.1	62.6	83.4	52.7	81.8	57.3	93.0	66.2
Selma, Ala	89.9	65.3	88.6	67.5	89.0	65.0	81.9	57.4	80.1	59.0	[4]90.6	[4]68.6
Mobile, Ala.:												
Aberdeen, Miss	88.5	70.7	86.7	66.6	86.7	65.7	79.0	54.8	[2]81.1	[2]58.1	89.9	68.3
Columbus, Miss	95.4	70.9	93.7	67.2	92.6	66.4	83.3	56.5	84.0	59.2	95.3	71.6
Evergreen, Ala	93.9	77.0	93.3	73.9	92.4	70.5	85.2	68.4	(8)	(8)	(8)	(8)
Livingston, Ala	93.9	72.1	91.5	67.8	91.0	66.0	[7]81.0	[7]55.0	[5]85.0	[5]67.7	[4]94.0	[4]77.0
Macon, Miss	95.6	72.9	92.4	64.2	93.4	64.4	82.9	55.8	83.2	58.5	95.0	68.2
Meridian, Miss	96.1	71.5	92.5	66.4	92.2	64.4	79.3	54.8	82.5	61.5	93.7	71.1
Mobile, Ala	89.7	73.7	88.9	71.2	87.5	71.0	82.5	68.6	80.2	64.1	88.2	71.0
Okolona, Miss	[2]96.7	[2]70.5	93.7	66.7	[1]92.6	[1]65.4	84.4	55.2	[2]84.2	[2]63.3	92.9	73.9
Waynesborough, Miss	93.6	71.1	92.3	67.4	91.3	65.0	83.7	56.2	83.7	60.1	91.3	69.1
New Orleans, La.:												
Alexandria, La	95.7	71.3	92.5	68.6	91.0	67.0	81.0	59.0	81.1	62.4	92.2	68.7
Amite City, La	96.9	72.5	93.6	68.2	91.6	65.2	85.7	58.3	83.3	58.5	91.6	68.2
Brookhaven, Miss	94.5	78.2	90.9	67.2	90.8	66.8	83.8	58.1	83.4	58.8	94.0	67.5
Cheneyville, La	95.8	73.1	91.9	67.5	90.8	66.6	81.7	58.7	84.2	61.5	95.2	68.2
Coushatta Chute, La	97.4	73.9	94.8	69.0	93.0	68.0	79.0	57.0	80.5	59.7	89.3	68.5
Hazlehurst, Miss	97.5	80.3	93.2	70.4	92.7	65.8	89.4	57.8	89.1	60.4	99.1	68.3
Lafayette, La	92.5	74.4	91.3	70.2	91.0	70.0	82.9	60.7	82.5	64.6	91.5	70.6
Minden, La	100.1	73.2	95.2	68.4	93.5	69.2	81.8	56.7	83.9	57.6	94.3	68.3
Natchez, Miss	92.3	75.2	89.6	70.3	88.9	70.5	80.1	61.2	83.0	61.0	92.2	69.2
Natchitoches, La	90.5	76.8	90.0	70.6	87.6	70.5	77.9	59.5	80.3	60.5	91.2	69.6
New Orleans, La	90.8	77.8	88.1	74.4	86.8	73.9	80.3	67.4	80.5	68.4	89.0	76.8
Opelousas, La	96.6	70.1	93.8	66.7	93.7	67.3	84.0	59.6	84.2	62.6	95.1	69.1
Shreveport, La	99.1	77.0	94.7	72.1	91.9	71.6	77.5	59.5	83.6	62.3	93.4	72.3
Whiteville, La	94.5	74.6	91.9	69.1	91.0	68.5	82.3	59.9	82.2	62.3	(8)	(8)
Galveston, Tex.:												
Austin, Tex	100.0	74.0	[4]96.9	[4]72.9	94.8	72.3	(6)	(6)	(6)	(6)	95.1	72.2
Beaumont, Tex	(6)	(6)	[9]94.3	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
Belton, Tex	98.7	(6)	96.2	(6)	94.2	(6)	(6)	(6)	80.9	57.5	92.9	54.3
Columbia, Tex	92.8	73.6	91.5	71.0	89.7	70.7	(6)	(6)	82.2	66.4	88.7	72.8
Corsicana, Tex	99.3	74.4	96.2	70.1	94.6	71.8	(6)	(6)	83.1	58.7	94.3	62.7
Cuero, Tex	99.5	74.8	96.4	72.7	93.0	71.0	(6)	(6)	[3]86.5	[3]64.5	97.0	72.0
Dallas, Tex	100.8	75.7	96.1	71.6	91.0	72.0	80.0	57.0	[3]83.5	(10)	94.1	67.4
Galveston, Tex	90.6	80.4	89.1	78.7	87.2	79.0	79.7	69.9	81.3	70.6	88.7	79.0
Hearne, Tex	97.7	73.0	94.5	69.5	91.3	68.3	(6)	(6)	83.2	59.3	93.4	69.7
Hempstead, Tex	95.1	[11]75.7	91.5	75.2	90.1	79.5	(6)	(6)	(8)	(8)	......	......
Houston, Tex	98.7	74.4	95.3	70.8	89.4	70.4	78.2	61.0	82.1	65.1	89.5	71.3
Huntsville, Tex	97.1	75.1	95.5	71.1	92.6	71.1	(6)	(6)	82.2	61.7	92.7	70.9
Longview, Tex	[2]99.9	[2]68.7	98.4	68.0	90.6	66.4	(6)	(6)	82.2	(10)	99.3	64.4
Luling, Tex	(6)	(6)	98.7	74.2	94.1	75.5	83.5	63.5	(6)	(6)	[1]92.2	[1]76.6
Orange, Tex	[12]91.5	[12]82.2	[13]92.5	[13]80.1	[13]90.2	[13]70.5	[3]85.0	[3]52.0	[15]83.8	[15]69.4	90.8	79.3
Palestine, Tex	93.9	74.8	91.4	70.3	90.3	70.7	77.0	59.1	79.5	61.3	89.4	70.9
San Antonio, Tex	95.2	75.0	92.4	73.5	89.4	70.4	78.7	64.0	[14]81.2	[14]63.6	91.4	71.1
Sour Lake, Tex	[3]96.3	[3]71.9	[13]94.3	[13]67.4	[5]91.7	[5]67.3	[3]81.8	[3]58.4	[12]84.4	[12]64.3	[13]91.8	[13]68.7
Tyler, Tex	97.8	73.7	93.7	69.5	92.5	71.0	(6)	(6)	82.5	58.0	93.6	68.8
Waco, Tex	100.3	77.0	97.5	73.1	94.0	74.0	(6)	(6)	82.0	61.0	92.6	71.7
Weatherford, Tex	[1]98.5	[1]71.4	[2]94.8	[2]68.1	92.6	72.8	(6)	(6)	[2]76.8	[2]50.3	[1]88.6	[1]58.0
Weimar, Tex	97.9	77.4	92.5	74.4	92.8	76.2	82.4	63.0	83.7	63.1	94.6	71.8

[1] Twenty-nine days only.
[2] Thirty days only.
[3] Twenty-seven days only.
[4] Twenty-eight days only.
[5] Twenty-five days only.
[6] No record.
[7] Twenty-four days only.
[8] Observations discontinued.
[9] Twenty days only.
[10] Record incomplete.
[11] Seventeen days only.
[12] Eighteen days only.
[13] Twenty-six days only.
[14] Twenty-three days only.
[15] Sixteen days only.

Mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Vicksburg, Miss.:	°	°	°	°	°	°	°	°	°	°	°	°
Edwards, Miss	93.9	73.7	91.4	70.2	93.2	68.3	82.4	59.3	83.2	61.2	92.9	71.0
Jackson, Miss	96.5	72.1	[2]91.1	[2]65.1	92.2	66.7	80.6	57.6	84.2	59.2	94.1	68.4
Lake, Miss	93.0	69.7	[2]90.0	[2]65.3	89.6	63.7	82.1	52.8	82.3	54.2	92.9	58.8
Monroe, La	98.0	74.8	90.8	69.4	90.2	68.3	[3]80.5	[3]57.4	80.1	60.9	91.2	70.3
Vicksburg, Miss	93.7	74.8	90.5	69.8	89.9	70.0	80.8	61.0	[4]81.2	[4]61.5	91.6	74.2
Little Rock, Ark.:												
Arkansas City, Ark	94.8	73.6	[5]90.1	[5]68.5	[2]87.1	[2]68.7	(6)	(6)	(1)	(1)	(6)	(6)
Brinkley, Ark	96.1	(1)	92.8	(1)	[4]86.4	(1)	[7]78.6	(1)	81.9	55.5	91.6	66.2
Devall's Bluff, Ark	[3]91.0	[3]68.8	[3]88.0	[3]64.5	[2]88.6	[2]63.7	78.4	51.4	79.2	52.8	89.5	65.1
Fort Smith, Ark	96.7	72.1	90.1	68.0	92.2	68.4	79.3	55.0	76.8	56.7	86.3	67.9
Helena, Ark	91.1	71.5	88.5	67.2	84.2	64.9	74.8	55.3	80.2	57.1	91.6	68.8
Kensett, Ark	93.4	69.0	89.5	68.7	87.7	63.4	75.0	52.0	[7]78.1	[9]56.7	83.1	67.2
Little Rock, Ark	93.3	72.9	88.8	68.4	86.5	67.6	75.8	57.5	77.9	60.1	89.0	71.8
Madison, Ark	[3]97.0	[3]69.0	94.6	64.7	(1)	(1)	75.6	53.4	83.0	53.6	91.5	65.6
Magnolia, Ark	96.7	74.2	89.0	74.0	92.0	71.2	80.5	62.6	83.3	56.0	93.7	69.3
Malvern, Ark	98.1	70.8	91.7	67.4	89.2	63.7	82.7	58.2	82.0	[5]51.8	94.4	66.9
Monticello, Ark	[3]93.7	[10]72.1	[5]91.1	[5]65.4	[11]90.6	[11]66.8	[9]77.6	[9]54.6	[3]79.8	[3]57.0	93.1	66.7
Newport, Ark	[3]93.9	[3]58.6	89.4	52.6	87.4	52.1	[5]74.4	[5]42.8	[4]80.1	[5]57.4	93.5	67.0
Paris, Tex	98.2	71.5	93.5	66.6	91.7	67.6	(1)	(1)	80.1	53.0	90.4	64.2
Pine Bluff, Ark	93.6	75.6	88.8	75.0	89.6	70.3	75.3	45.3	78.9	51.1	90.1	65.9
Prescott, Ark	[5]97.5	[5]61.2	[10]91.6	56.1	90.5	56.8	77.6	43.7	[4]81.1	[4]49.6	93.4	61.5
Russellville, Ark	[12]93.6	[12]64.7	[8]91.2	[8]66.4	89.0	68.7	(6)	(6)	75.8	56.6	[4]90.9	[4]67.4
Texarkana, Ark	95.5	65.2	92.8	61.0	90.7	61.9	78.0	48.0	81.9	45.8	88.9	67.1
Memphis, Tenn.:												
Batesville, Miss	95.3	71.0	92.4	66.7	91.8	66.4	81.6	54.3	81.0	56.4	83.8	68.3
Bolivar, Tenn	89.8	70.8	87.8	65.0	88.0	64.9	(6)	(6)	76.6	54.7	87.0	66.9
Brownsville, Tenn	91.3	70.2	88.5	66.3	87.8	66.1	78.1	58.6	79.2	57.0	89.1	67.6
Corinth, Miss	92.2	68.3	89.1	65.5	89.6	64.2	80.2	58.5	80.1	54.2	88.2	67.9
Covington, Tenn	92.9	69.4	89.7	63.6	87.9	63.2	77.6	52.8	79.1	55.7	89.4	67.1
Decatur, Ala	92.8	69.0	89.5	65.1	89.7	63.3	80.5	55.0	80.4	54.8	91.9	65.7
Dyersburg, Tenn	[3]93.4	[3]68.2	89.8	62.7	87.9	63.8	76.2	52.2	76.8	55.2	[4]86.3	[4]66.3
Grand Junction, Tenn	90.3	68.9	88.6	64.1	88.3	64.6	[3]79.0	[3]54.6	77.3	56.4	88.3	67.3
Grenada, Miss	[11]93.4	[11]70.5	[8]89.7	[8]66.2	[2]90.1	[2]64.8	80.8	53.6	84.5	52.1	93.2	59.2
Hernando, Miss	95.9	65.8	93.7	62.3	[4]91.3	[4]61.7	80.2	56.0	82.9	56.8	94.0	80.4
Holly Springs, Miss	90.0	70.5	87.1	67.4	85.0	67.0	77.4	57.1	77.9	59.3	89.1	70.3
Memphis, Tenn	90.9	73.9	86.9	70.4	86.3	69.2	75.5	58.6	77.6	56.7	89.0	70.7
Milan, Tenn	92.1	68.3	88.8	63.8	87.6	63.9	77.0	53.2	80.7	55.1	92.1	66.7
Nashville, Tenn	87.2	70.4	85.8	66.5	84.8	65.8	75.8	56.7	75.1	57.8	84.3	68.5
Oxford, Miss	92.1	68.7	88.1	61.2	87.4	65.4	78.8	55.4	79.4	56.6	90.7	68.3
Paris, Tenn	89.9	67.5	87.1	62.6	86.1	62.5	75.5	51.8	[3]78.4	[4]47.9	87.4	57.1
Scottsborough, Ala	89.3	66.9	87.5	63.3	88.0	61.1	80.1	58.0	[9]77.7	[8]55.8	87.3	63.7
Tuscumbia, Ala	90.3	68.2	88.6	64.7	88.9	62.9	81.1	54.7	77.9	54.6	90.1	65.6
Withe, Tenn	(6)	(6)	92.9	63.7	92.5	63.0	81.7	52.9	79.9	64.1	89.8	63.2

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[1] No record.
[2] Twenty-seven days only.
[3] Thirty days only.
[4] Twenty-nine days only.
[5] Twenty-eight days only.
[6] Record incomplete.
[7] Twenty-three days only.
[8] Twenty-six days only.
[9] Twenty-four days only.
[10] Seventeen days only.
[11] Twenty-five days only.
[12] Nineteen days only.

APPENDIX 23.

Mean temperature (in degrees Fahrenheit) at 7 a. m., 3 and 11 p. m. (Washington time), at from January 1, 1880,

Stations.	January.			February.			March.			April.			May.		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me	16.9	23.0	19.5	20.5	26.6	22.7	25.0	31.5	27.8	35.4	42.1	35.9	45.4	51.9	44.0
Portland, Me	20.7	29.3	23.7	24.8	33.4	28.0	30.4	38.7	32.8	41.0	50.4	42.6	52.0	60.6	52.7
Mount Washington, N. H.	5.8	6.8	5.7	8.5	9.6	8.1	8.5	11.2	9.0	18.4	22.4	19.5	32.0	36.9	33.6
Boston, Mass	23.2	30.6	25.4	26.5	35.1	28.5	30.9	38.2	32.5	40.8	48.4	41.6	53.2	59.9	52.8
New Haven, Conn.	23.0	21.0	25.6	27.0	35.2	29.5	31.0	39.5	33.0	41.9	50.9	42.9	54.4	63.3	54.1
New London, Conn.	25.4	32.7	28.0	29.2	36.3	30.9	33.3	39.9	34.3	43.5	49.9	42.7	55.6	60.4	53.4
Middle Atlantic States:															
Albany, N. Y	22.1	28.5	24.3	27.0	34.0	29.0	31.8	38.8	33.8	44.0	53.3	45.9	57.7	67.4	58.5
New York City	27.3	33.5	29.3	30.7	37.6	32.4	33.5	41.6	35.0	43.8	52.3	45.3	55.5	65.1	57.3
Philadelphia, Pa	28.8	34.9	31.5	33.9	41.5	36.1	36.8	44.9	39.4	45.7	56.0	48.0	57.7	70.3	60.0
Atlantic City, N. J.	29.8	35.8	31.6	33.1	39.3	34.8	35.7	42.9	37.3	44.7	50.6	44.9	56.1	61.5	55.8
Barnegat City, N. J.	29.5	35.0	31.1	32.8	38.5	34.0	35.6	42.1	37.1	44.9	49.1	44.2	56.8	60.0	55.0
Cape May, N. J	32.6	37.3	34.6	36.5	42.1	38.4	38.9	44.3	40.9	46.3	52.0	48.4	57.6	63.8	58.4
Sandy Hook, N. J	28.6	33.5	30.2	31.9	37.6	32.9	34.8	41.3	36.7	44.0	51.8	45.5	56.3	64.9	57.2
Baltimore, Md	31.8	38.1	33.9	36.2	44.3	38.6	38.5	47.3	41.8	48.0	58.5	51.3	60.8	72.0	63.1
Washington City	28.9	36.7	31.5	34.2	44.2	37.0	36.4	47.0	40.1	46.4	58.9	49.7	59.7	73.2	62.0
Cape Henry, Va	37.9	42.4	39.6	42.5	48.4	44.3	43.7	50.1	45.4	51.2	58.6	52.0	62.2	70.4	62.8
Lynchburg, Va	33.5	42.6	36.4	38.7	50.3	42.3	40.7	52.9	44.6	50.2	63.4	54.0	63.0	76.0	64.9
Norfolk, Va	38.1	44.2	39.2	42.7	52.1	45.1	44.0	53.3	46.6	52.4	61.5	53.0	64.3	74.4	64.0
South Atlantic States:															
Charlotte, N. C	37.2	46.4	41.0	42.5	54.7	47.7	44.8	57.2	49.1	52.9	66.2	57.3	63.8	76.5	66.8
Kitty Hawk, N. C	40.5	44.4	41.5	44.5	50.0	45.7	45.0	51.2	46.2	51.3	57.7	51.9	62.4	70.0	62.0
Smithville, N. C	43.9	51.2	46.5	48.1	56.7	51.0	49.7	58.6	53.4	56.8	64.9	58.8	67.0	75.4	68.2
Wilmington, N. C	44.4	53.9	46.7	48.3	60.4	51.8	50.0	61.3	53.8	57.1	67.6	59.0	66.4	76.7	67.5
Charleston, S. C	47.8	56.1	50.8	51.7	61.9	55.1	53.3	64.6	57.5	60.3	69.5	62.9	69.6	77.7	70.9
Augusta, Ga	43.6	55.2	47.7	48.0	63.5	53.8	50.0	65.9	56.1	57.6	72.6	62.3	65.9	81.4	70.0
Savannah, Ga	48.4	58.7	52.2	52.0	64.2	56.5	54.9	67.2	59.6	62.2	72.8	65.0	70.5	79.8	71.4
Jacksonville, Fla	52.5	64.0	55.6	55.9	68.5	59.7	58.6	71.5	62.4	64.9	76.5	67.3	72.4	80.7	71.9
Florida Peninsula:															
Cedar Keys, Fla	54.5	62.4	57.6	58.5	66.9	61.6	60.4	68.9	64.1	67.0	75.3	69.3	72.6	81.2	74.1
Key West, Fla	69.1	75.5	70.8	70.7	76.8	72.0	71.4	78.0	72.4	75.0	81.6	75.1	78.7	83.7	77.8
Eastern Gulf States:															
Atlanta, Ga	39.6	48.5	44.2	44.4	55.4	50.1	46.9	59.5	52.7	55.1	67.5	60.4	63.3	75.9	68.1
Pensacola, Fla	50.1	58.6	53.5	53.7	63.6	57.8	57.0	67.4	61.0	64.1	73.1	66.7	70.3	79.4	72.1
Montgomery, Ala	44.3	55.1	49.2	48.8	62.1	54.3	51.5	66.0	57.6	58.9	73.7	64.0	66.5	81.3	71.0
Vicksburg, Miss	44.4	53.9	48.8	49.3	60.8	54.4	53.1	66.1	59.0	59.6	73.9	65.5	66.8	81.1	71.4
New Orleans, La	52.2	60.4	55.2	56.5	65.5	59.6	59.5	68.9	63.4	66.0	75.0	69.0	72.4	80.2	74.3
Western Gulf States.															
Shreveport, La	41.7	52.1	46.5	47.1	57.6	51.7	51.9	65.7	58.8	59.4	74.7	65.5	67.1	81.0	72.0
Little Rock, Ark	37.8	47.5	42.2	43.4	52.6	48.1	48.2	59.8	54.2	56.0	69.6	62.5	64.1	77.1	68.9
Galveston, Tex	51.0	56.0	53.8	55.7	61.3	58.0	61.0	67.2	63.7	67.2	73.4	69.2	73.5	79.7	75.3
Indianola, Tex	49.7	57.0	52.4	55.4	61.9	57.5	61.3	68.8	63.9	67.2	75.5	69.8	73.2	80.5	75.5
Rio Grande Valley:															
Brownsville, Tex	53.7	65.2	56.9	58.4	69.0	61.1	64.3	75.1	67.0	69.7	80.5	72.3	74.8	85.1	76.7
Ohio Valley and Tennessee:															
Chattanooga, Tenn	37.6	46.2	42.0	43.2	53.2	47.7	45.9	57.5	51.1	54.3	67.3	58.5	62.0	70.6	66.0
Knoxville, Tenn	34.2	44.2	38.6	39.8	51.7	44.8	41.9	54.9	48.3	51.1	65.7	55.9	60.1	75.9	64.6
Memphis, Tenn	36.5	45.1	40.7	41.6	51.6	47.1	47.0	56.7	52.8	56.5	68.0	61.6	65.5	77.2	69.1
Nashville, Tenn	35.2	44.3	39.4	40.9	51.2	45.2	44.2	55.3	49.5	53.5	66.5	58.7	63.1	77.0	67.5
Louisville, Ky	32.6	39.3	35.1	38.0	46.4	41.8	40.5	50.1	44.9	50.8	62.0	55.3	61.3	74.1	65.3
Indianapolis, Ind	26.2	33.5	28.7	31.0	39.8	35.7	34.9	45.6	39.7	46.6	58.0	51.2	58.8	70.7	62.5
Cincinnati, Ohio	31.2	38.9	34.3	36.9	45.3	40.8	39.5	49.1	43.9	49.0	60.1	53.8	59.8	72.3	64.6
Columbus, Ohio	26.3	32.9	29.5	32.3	39.3	36.0	34.7	43.7	39.0	44.6	56.2	49.3	56.9	70.0	61.5
Pittsburg, Pa	28.6	34.8	31.6	32.7	40.6	36.0	34.0	43.8	38.0	44.5	57.9	48.5	56.2	72.3	60.7
Lower Lakes:															
Buffalo, N. Y	22.5	26.0	23.6	24.1	29.3	26.4	28.0	32.3	28.8	37.2	43.7	39.8	50.8	57.3	52.6
Oswego, N. Y	23.6	28.1	25.4	26.4	31.6	28.8	29.3	33.9	31.6	39.6	44.5	41.6	52.1	58.5	54.2
Erie, Pa	25.1	29.9	27.0	28.3	33.2	30.8	30.2	35.6	33.4	41.5	46.7	42.8	55.1	61.1	56.2
Cleveland, Ohio	23.5	28.7	25.2	27.9	33.2	30.8	30.4	35.8	33.4	41.2	47.4	43.6	54.6	62.4	57.4
Toledo, Ohio	24.2	31.1	26.5	28.6	35.3	32.2	31.9	40.2	35.9	42.7	51.9	46.1	56.8	66.2	58.8
Detroit, Mich	23.4	28.9	25.0	28.0	34.5	30.6	31.0	38.9	33.9	41.2	51.8	44.0	54.0	65.3	57.2

APPENDIX 23.

stations of the Signal Service, United States Army, for each month of the year. (*Computed to December* 31, 1884.)

June.			July.			August.			September.			October.			November.			December.		
7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.	7 a. m.	8 p. m.	11 p. m.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
54.8	62.1	51.8	59.1	66.0	56.8	59.2	67.0	57.3	54.4	61.1	53.8	44.7	50.4	45.0	34.8	38.8	35.4	24.3	28.4	25.6
61.8	71.1	62.0	66.3	75.9	66.6	65.1	74.9	66.0	58.8	67.9	60.3	47.1	56.6	49.2	36.5	44.3	38.8	27.7	33.6	29.6
42.5	47.7	42.7	44.8	49.9	45.4	45.1	50.4	46.3	41.2	45.1	41.6	29.0	32.1	29.5	16.8	18.2	17.2	10.2	11.5	10.9
63.4	71.5	62.4	67.1	75.6	67.0	65.6	75.0	65.9	60.0	69.4	61.2	48.1	57.1	49.8	36.6	45.3	38.7	28.4	34.9	30.3
64.2	73.5	62.9	68.2	76.8	67.8	65.8	76.2	66.5	60.7	71.7	62.6	48.6	59.7	50.7	36.7	45.7	39.5	27.8	34.9	30.4
64.8	70.2	62.3	69.2	74.7	67.3	67.5	73.9	66.4	62.6	69.9	62.7	51.3	29.3	52.1	39.0	46.7	41.1	30.1	36.5	32.8
67.0	76.6	66.6	70.4	79.2	70.1	67.9	78.7	69.3	61.9	72.4	63.5	48.9	58.9	51.3	37.9	45.2	40.0	28.7	33.4	30.3
64.9	74.1	65.7	69.3	78.2	70.3	67.8	77.4	69.5	63.4	73.5	65.5	52.3	61.7	54.7	39.9	47.5	42.1	31.3	37.0	33.1
67.2	78.4	68.7	70.9	81.7	72.8	70.0	80.0	71.1	64.5	76.4	67.1	53.2	63.9	56.0	40.9	49.0	43.6	32.6	39.1	34.9
65.5	70.7	64.4	70.5	77.3	70.0	69.5	75.5	69.9	66.2	73.1	67.0	55.7	62.7	56.9	41.3	49.2	43.4	33.1	39.4	35.1
66.4	69.7	63.6	71.7	75.5	69.5	70.2	74.0	69.0	66.6	71.4	66.2	55.5	61.3	56.2	41.8	48.8	43.3	33.3	39 1	34.7
66.4	72.4	66.7	71.7	77.9	72.6	70.7	76.7	71.1	67.6	74.0	68.7	58.0	64.3	59.6	45.3	51.6	47.2	36.5	40.9	38.1
66.1	74.1	66.4	70.8	78.8	72.4	69.5	77.8	71.0	65.7	74.1	67.2	55.0	62.3	56.6	42.4	48.6	44.4	33.0	38.0	34.7
69.[illegible]	79.9	70.9	73.0	83.5	74.1	70.2	81.5	72.4	65.3	77.2	68.2	54.9	66.0	57.9	42.1	50.8	44.9	34.3	41.6	37.0
68.7	80.4	69.9	71.5	84.2	72.8	69.3	82.6	71.2	64.8	78.8	67.3	53.3	67.2	56.6	39.6	51.0	43.1	31.5	40.6	34.5
70.8	78.7	70.3	74.8	82.8	74.1	73.4	81.2	78.6	70.4	78.7	71.0	61.5	69.0	63.4	49.3	56.1	51.0	40.3	46.3	42.7
71.0	81.8	71.6	73.0	85.6	74.7	71.0	83.7	73.4	65.5	79.6	68.2	55.0	69.5	58.9	41.3	53.9	44.4	34.9	45.6	37.7
73.0	81.1	71.0	76.8	84.7	75.1	74.6	81.9	73.6	69.6	79.2	70.4	60.0	69.2	61.9	47.6	56.3	50.3	39.9	47.0	42.6
72.0	82.3	73.9	74.9	86.0	77.3	71.8	82.6	75.7	65.2	77.3	68.9	55.0	69.2	60.1	43.5	56.3	48.4	37.7	48.7	41.9
71.4	78.3	70.8	76.6	80.7	75.4	74.6	79.8	74.4	71.5	78.5	71.9	63.3	69.2	63.8	51.3	57.2	52.7	42.8	47.9	44.5
74.6	81.5	75.0	78.2	85.1	78.7	75.7	83.1	77.5	71.5	79.2	73.9	62.9	71.8	65.8	49.9	60.3	53.5	44.3	53.1	47.5
73.4	82.5	74.2	77.0	85.2	77.4	74.7	83.7	76.3	70.6	80.4	72.8	62.0	73.7	65.2	49.8	62.4	53.7	43.9	55.7	47.9
77.0	84.5	77.1	79.0	87.6	80.4	77.1	85.5	79.1	73.0	81.8	75.6	65.6	74.7	68.2	53.5	63.3	57.0	48.2	57.6	51.5
73.2	86.8	76.2	76.4	89.9	79.4	73.8	87.4	77.5	69.5	83.8	73.5	61.5	77.1	64.4	47.9	61.3	52.8	43.5	57.2	47.8
77.3	86.0	77.5	80.5	88.6	80.6	77.3	85.8	78.5	72.5	82.2	75.1	64.8	75.5	68.3	52.8	65.1	57.2	48.7	60.2	52.7
78.7	85.6	77.2	80.6	88 4	79.5	78.3	86.3	78.3	73.6	83.7	75.7	68.9	78.3	70.6	57.4	68.8	60.9	52.4	64.4	56.0
78.3	84.9	78.8	80.7	86.5	80.9	78.8	86.6	79.7	75.4	85.1	78.3	70.1	79.4	72.8	60.1	60.5	63.1	55.2	63.3	58.2
82.4	87.6	80.9	83.7	89.4	82.8	82.3	88.1	82.1	80.6	86.3	81.1	77.5	82.4	78.3	73.8	78.5	74.7	69.2	74.4	70.6
71.0	81.3	73.8	73.5	85.0	77.1	70.7	82.4	74.4	66.0	79.0	71.2	58.9	72.1	64.2	45.4	57.5	50 6	40.1	50.8	44.5
77.1	84.2	77.9	78.2	85.6	79.3	76.5	85.4	78.9	72.7	83.1	76.0	67.1	77.8	70.6	54.0	65.6	57.7	50.6	59.9	54.0
73.8	86.8	76.8	75.9	89.0	79.1	73.8	87.4	77.7	68.6	85.0	74.4	62.6	78.2	68.3	48.1	62.6	53.4	44.6	56.3	49.1
74.0	88.2	77.4	75.5	89 7	78.7	73.4	89.8	77.7	68.2	84.4	73.5	62.5	77.2	67.1	48.8	61.3	52.8	45.7	56.9	50.5
78.4	85.1	79.8	80.1	87.1	81.8	78.7	86.3	80.9	75.1	83.7	77.9	69.6	78.0	72.1	57.0	65.4	59.8	53.5	61.5	56.1
74.1	89.4	79.2	76.3	91.9	81.0	78.9	91.0	79.8	68.4	84.7	74.1	61.5	77.1	66.6	47.1	60.0	52.7	43.8	55.2	48.4
72.0	84.9	76.8	74.1	86.9	79.1	72.3	86.2	77.5	65.9	80.3	71.5	59.8	72.2	64.4	45.1	56.6	49.8	40.0	49.9	44.4
79.8	86.2	81.2	81.2	87.9	82.8	80.5	86.9	82.6	77.5	88.1	79.7	72.2	77.5	74.3	58.6	63.8	61.1	55.1	60.1	57.3
78.5	86.9	80.5	79.7	88.4	81.4	78.7	87.2	81.0	76.1	83.1	78.9	71.2	78.4	74.1	58.5	64.8	61.0	53.7	60.7	56.0
78.2	88.6	81.0	78.8	89.9	81.6	76.7	89.6	80.3	74.3	86.2	77.7	71.1	81.7	73.8	59.9	70.4	63.1	56.6	66.8	59.2
70.0	82.6	72.4	72.1	85.5	75.0	70.8	83.6	73.9	64.5	79.5	69.2	57.6	71.7	62.0	43.3	56.0	48.0	38.3	47.6	41.4
67.7	81.0	71.0	69.8	82.8	72.8	68.0	83.3	71.8	62.9	79.8	67.9	54.9	72.4	59.9	40.1	54.6	45.0	34.1	45.3	37.5
72.2	83.8	74.9	74.4	85.7	77.4	73.4	86.4	76.9	66.4	80.1	71.4	59.7	71.8	64.1	44.3	55.2	48.8	38.9	47.6	43.2
71.4	83.5	73.8	72.6	85.7	76.2	71.2	85.3	75.7	64.7	79.6	70.0	58.0	71.6	62.6	42.0	54.5	47.2	37.0	45.9	40.3
69.8	80.3	72.0	72.2	84.0	75.3	69.5	84.0	74.6	63.8	78.6	68.8	55.7	67.6	59.5	41.6	51.2	45.2	35.6	41.4	37.9
68.2	78.6	70.7	70.6	81.9	73.5	67.9	81.8	72.5	61.1	75 5	66.2	51.6	63.5	55.8	36.2	46.0	40.1	28.9	35.2	31.3
69.0	79 8	72.5	71.6	83.4	76.1	69.5	82.8	74.7	64.4	77 3	69.5	55.2	66.2	59.1	40.4	50.1	43.8	33.7	40.7	36.1
68.0	77.3	69.2	68.4	81.4	72.5	66.0	80.4	71.1	60.8	75.7	65.8	51.0	63.1	55.2	36.2	45.9	40.2	29.9	35.5	32.0
65.0	78.8	68.0	66.6	81.7	70.0	64.5	81.9	69.5	60.8	77.3	65.5	51.6	64.6	54.7	38.5	47.6	41.1	31.6	37.6	33.0
61.1	67.8	62.3	65.4	71.7	67.1	64.7	73.7	67.0	60.3	69.1	62.3	48.5	55.9	50.0	36.5	41.5	37.5	28.9	31.8	29.5
61.5	67.6	62.0	66.5	71.9	67.6	65.4	72.0	67.4	60.1	68.0	62.4	48.3	55.6	50.4	37.1	42.0	38.7	28 5	32.0	29.7
64.7	70 0	64 8	68.4	73.8	68.8	67.0	74.2	67.9	61.9	69.4	63.4	51.4	58.7	53.3	38.4	43.7	39.8	30.6	34.4	31.9
63.9	71.1	65.7	67.2	74.9	69.1	65.1	74.8	68.3	61.1	70.7	63.7	50.2	59.2	53.3	36.2	42.9	38.1	28.5	32.4	29.3
66.[illegible]	74.3	67.7	69.0	79.0	71.8	66.6	77.5	70.2	61.2	72.4	65.0	50.5	60.0	54.0	37.1	44.8	39 .7	29.4	34.2	31.0
68.4	72.8	66.3	65.9	78.1	69.6	65.0	76.6	69.3	60.3	71.4	63.8	50.3	59.0	53.5	37.6	43.6	39.5	29.6	33.9	31.0

Mean temperature (in degrees Fahrenheit) at 7 a. m. 3 and 11 p. m.

Stations.	January.			February.			March.			April.			May.		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Upper Lakes:															
Alpena, Mich	14.6	22.7	16.6	15.8	24.6	18.9	19.2	29.2	23.9	32.0	40.8	34.6	46.9	53.5	47.8
Escanaba, Mich	9.8	18.9	13.8	11.0	22.0	15.9	16.3	29.4	21.9	31.5	41.6	34.0	46.7	55.7	47.9
Grand Haven, Mich.	23.8	27.7	24.7	24.8	31.0	28.0	28.5	35.2	31.7	39.6	47.1	42.8	53.5	59.9	54.7
Marquette, Mich	13.7	20.4	15.5	13.7	22.4	16.9	19.4	28.2	23.0	33.6	40.6	35.2	47.8	53.2	47.6
Port Huron, Mich	18.6	25.3	20.6	22.8	29.8	25.1	25.8	32.4	28.7	37.7	43.9	38.6	50.5	58.7	50.6
Chicago, Ill	22.1	27.9	24.0	25.8	33.4	29.6	31.2	38.2	35.0	41.8	48.6	45.1	54.5	60.9	56.6
Milwaukee, Wis	17.8	23.4	20.5	22.0	29.0	26.3	27.7	34.1	31.7	38.8	43.5	42.6	51.5	57.4	53.7
Duluth, Minn	5.4	14.4	10.1	9.8	20.2	15.7	18.4	29.5	24.7	33.6	42.0	37.7	45.0	52.4	47.6
Upper Mississippi Valley:															
Saint Paul, Minn	8.2	16.8	12.8	13.0	23.9	18.2	23.1	34.2	28.5	38.2	51.7	44.8	51.5	66.3	57.5
La Crosse, Wis	11.8	20.4	15.7	17.1	27.5	23.6	25.7	35.6	31.7	40.9	52.6	47.4	55.1	66.4	60.6
Davenport, Iowa	18.8	26.9	23.1	23.8	33.8	29.1	30.3	40.5	35.5	43.4	55.9	49.2	56.4	68.5	61.1
Des Moines, Iowa	15.6	24.9	20.5	20.4	31.3	25.7	28.8	40.1	33.8	41.8	56.4	48.6	54.3	68.5	60.0
Dubuque, Iowa	18.8	23.9	19.4	19.0	30.9	25.3	27.2	38.8	33.1	40.9	54.9	47.5	54.6	67.9	59.4
Keokuk, Iowa	20.7	28.6	24.2	25.8	35.5	30.6	32.3	43.4	37.1	45.4	58.8	51.1	58.0	70.4	62.1
Cairo, Ill	32.3	39.8	35.5	38.9	46.1	42.4	42.8	52.2	47.9	53.8	64.0	58.7	63.2	74.0	67.0
Springfield, Ill	25.1	31.2	27.0	30.2	38.2	33.7	35.3	45.1	39.6	47.1	59.2	52.5	57.9	69.8	63.6
Saint Louis, Mo	26.5	33.3	29.4	31.9	40.4	35.8	36.7	47.6	42.0	48.6	61.7	54.4	58.9	72.5	64.3
Missouri Valley:															
Leavenworth, Kans	22.0	31.8	27.0	26.8	38.0	32.1	34.5	47.8	40.7	46.7	61.3	53.2	58.0	71.1	63.7
Omaha, Nebr	15.5	25.5	20.7	19.9	30.4	25.4	28.9	40.8	34.5	43.0	56.8	49.5	56.6	69.4	61.7
Yankton, Dak	10.2	22.4	15.0	13.1	24.4	18.8	23.5	35.9	29.0	38.0	52.4	44.0	53.3	67.6	58.1
Extreme Northwest:															
Bismarck, Dak	0.9	10.7	4.4	5.4	17.5	9.8	15.4	27.5	20.7	31.6	46.3	37.4	47.5	64.2	53.6
Buford, Fort, Dak	0.8	11.8	3.8	3.8	17.4	9.3	15.8	29.6	20.8	30.8	48.6	37.9	44.7	63.9	54.3
Northern Slope:															
Benton, Fort, Mont.	11.9	21.3	14.7	13.1	26.0	19.1	25.6	42.8	31.8	32.3	52.2	40.9	42.7	64.3	52.6
Cheyenne, Wyo	20.1	32.1	22.7	19.3	33.8	23.2	25.5	42.3	30.5	31.3	49.5	38.6	40.5	59.3	48.0
North Platte, Nebr.	18.9	29.8	19.3	15.8	33.9	22.7	27.0	45.1	34.6	37.9	56.3	46.3	50.2	66.2	57.2
Middle Slope:															
Denver, Colo	23.4	38.0	29.5	22.8	37.2	28.9	30.9	48.0	39.8	37.9	55.8	47.8	46.7	63.8	55.7
Pike's Peak, Colo	− 0.5	4.6	1.8	0.7	6.5	3.0	3.7	11.4	6.4	8.9	17.7	12.8	17.7	26.6	21.0
Dodge City, Kans	19.9	30.2	26.2	22.4	40.3	29.7	32.6	52.1	40.7	42.0	63.5	51.2	53.2	71.3	60.1
Elliott, Fort, Tex	23.7	41.8	29.8	26.6	45.8	34.1	36.4	56.8	44.2	44.3	67.4	54.9	54.0	72.6	62.7
Southern Slope:															
Concho, Fort, Tex	35.2	52.6	40.7	40.8	58.1	46.7	47.3	68.5	54.9	53.3	77.0	61.5	62.1	82.8	68.8
Stockton, Fort, Tex	34.8	54.7	40.3	39.0	60.0	46.6	45.2	68.8	54.4	50.8	76.3	61.0	63.7	82.9	68.9
Southern Plateau:															
El Paso, Tex	34.1	53.1	42.9	39.3	58.8	48.7	44.9	65.9	55.8	51.8	74.8	62.3	59.3	84.1	71.3
Apache, Fort, Ariz.	23.1	45.9	32.5	26.7	48.7	36.7	31.6	56.2	42.8	34.9	64.8	49.0	40.4	72.8	56.8
Grant, Fort, Ariz	34.1	49.8	42.5	37.7	51.6	43.6	41.9	58.3	40.8	47.2	66.6	57.0	55.9	76.1	65.5
Prescott, Ariz	25.4	45.1	33.0	26.4	45.9	35.6	32.2	52.7	42.7	37.7	60.0	49.7	43.5	69.3	58.3
Middle Plateau:															
Salt Lake City, Utah	24.5	32.1	27.2	25.4	34.8	28.9	34.5	46.1	39.3	42.0	54.2	47.8	50.0	64.8	56.9
Northern Plateau:															
Lewiston, Idaho	29.0	34.0	31.8	26.4	34.2	30.8	37.1	48.3	44.3	43.0	57.3	52.2	48.9	66.0	60.9
Dayton, Wash	28.2	35.2	29.3	24.0	35.8	27.5	35.2	50.9	41.0	40.5	58.2	47.9	45.7	67.0	55.0
North Pacific Coast:															
Olympia, Wash	35.9	39.5	38.0	33.9	39.4	37.4	38.1	47.1	44.7	41.6	52.7	49.7	44.1	59.0	56.6
Portland, Oreg	37.3	41.3	39.4	34.8	40.9	38.3	40.7	50.2	47.0	45.0	56.4	52.0	48.4	62.8	58.5
Middle Pacific Coast:															
Sacramento, Cal	40.7	48.8	46.3	42.4	51.7	49.1	47.4	58.5	54.4	50.5	62.2	57.6	55.5	70.1	64.7
San Francisco, Cal.	46.8	51.1	49.9	46.8	52.2	50.3	49.4	55.8	52.2	50.6	57.9	53.1	53.0	62.0	56.0
South Pacific Coast:															
Los Angeles, Cal	44.9	60.4	50.6	46.1	61.6	51.7	47.8	63.0	53.4	50.6	66.7	55.6	58.9	72.3	59.4
San Diego, Cal	47.0	60.0	51.4	48.1	59.9	52.6	50.4	60.6	54.2	53.2	63.3	56.9	57.1	66.6	60.4
Alaska Stations:															
Saint Michael's, Fort, Alaska	3.5	6.3	6.2	0.8	1.8	3.3	8.1	11.1	13.1	16.0	20.4	22.9	28.8	34.6	36.2

(*Washington time*) *at stations of the Signal Service, &c.*—Continued.

June.			July.			August.			September.			October.			November.			December.		
7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
57.0	68.2	56.8	61.1	69.8	61.8	60.0	69.9	62.1	54.2	68.9	56.0	42.6	51.7	44.5	29.9	35.5	31.0	22.2	26.7	28.1
57.4	66.7	59.0	61.2	71.5	63.2	59.9	70.0	62.6	53.8	63.8	56.8	42.8	50.7	45.5	27.8	34.3	30.2	19.3	24.8	21.2
62.6	68.3	62.5	66.6	71.8	66.6	64.0	72.2	66.7	58.7	67.6	61.1	48.0	55.9	50.9	36.2	40.8	37.8	28.3	31.5	29.6
56.8	62.0	55.6	61.8	68.3	61.1	60.8	67.9	60.7	53.7	62.2	54.7	43.2	50.2	44.4	28.3	34.2	30.2	21.0	25.8	22.4
60.3	68.0	60.1	63.9	72.6	64.6	63.2	73.1	65.4	58.1	68.6	60.2	46.6	55.2	48.6	32.8	39.2	33.9	24.8	29.5	26.1
62.5	68.9	64.0	67.4	75.2	69.8	67.4	75.5	70.5	60.9	70.1	64.0	50.4	58.5	53.9	35.3	42.6	38.5	26.1	31.8	28.9
59.4	65.6	61.4	64.2	72.4	66.6	64.2	72.5	67.4	57.7	66.1	61.1	47.7	55.5	51.3	32.1	38.6	35.5	23.0	27.8	25.6
55.6	62.3	56.8	61.9	70.3	63.3	60.9	68.3	63.2	52.6	61.2	55.4	42.1	49.8	45.2	24.7	31.9	27.5	12.4	20.4	15.9
61.2	73.9	65.9	63.6	77.8	68.8	63.0	77.1	68.6	53.6	67.4	58.7	48.7	54.5	47.5	26.1	35.5	29.6	15.3	22.8	18.2
64.1	74.6	68.7	66.1	77.4	70.9	65.0	77.0	70.3	56.8	69.0	62.2	46.5	56.4	51.4	29.7	38.3	33.9	18.9	25.9	22.4
64.8	75.8	68.9	67.9	80.3	72.7	66.6	79.9	71.7	59.8	72.9	64.2	49.4	60.4	53.7	34.4	43.9	38.4	25.5	32.4	28.8
63.5	76.7	68.3	66.2	80.7	71.2	64.7	80.8	70.4	56.9	72.6	62.1	46.8	60.0	51.2	31.3	41.7	34.8	21.5	29.2	24.0
62.7	75.2	67.4	65.9	79.6	70.7	64.4	79.1	69.7	56.6	71.4	61.8	46.6	58.5	51.2	30.6	40.8	35.1	21.4	28.6	24.7
67.1	78.4	69.9	70.6	83.1	74.8	68.1	82.9	73.0	60.4	76.2	66.0	50.0	62.4	54.3	34.8	44.8	38.5	25.3	32.8	28.5
72.0	81.6	74.1	74.5	84.4	76.8	71.9	84.2	75.7	64.9	78.0	69.1	56.8	68.9	60.9	41.6	51.8	45.9	35.2	42.9	38.1
66.6	77.6	70.2	69.9	82.1	73.8	67.4	81.9	72.5	60.2	75.3	65.7	51.4	62.9	55.6	37.1	46.4	40.5	29.1	35.1	31.5
67.7	80.3	71.8	71.1	84.3	75.6	69.4	84.1	74.9	63.0	78.3	69.1	53.4	65.5	58.1	38.9	48.6	42.7	31.5	38.0	34.1
67.5	80.3	72.7	70.6	83.6	75.9	68.3	83.0	74.3	60.3	76.8	66.5	50.0	64.1	55.1	35.2	47.0	39.2	26.9	36.2	30.8
66.4	78.8	71.0	69.8	82.1	74.6	67.2	81.5	73.0	56.2	73.0	64.3	47.7	60.2	52.6	30.8	42.4	35.7	21.1	29.4	24.4
63.6	77.2	68.3	66.0	80.0	71.1	64.7	81.3	70.9	53.7	72.0	59.6	42.9	57.6	48.1	25.8	40.1	30.1	16.0	26.3	19.0
58.3	73.8	63.5	60.2	76.7	66.4	58.7	77.6	66.9	47.1	66.0	54.4	36.3	51.7	41.2	20.0	32.0	24.1	8.7	17.5	10.7
55.8	74.1	63.0	57.7	76.9	64.8	55.8	78.7	65.6	43.9	65.7	51.8	34.1	50.4	40.0	19.1	31.0	22.7	6.0	16.6	8.2
53.5	73.2	62.9	58.6	79.6	68.2	57.5	79.4	68.6	45.6	65.5	55.2	34.2	50.2	41.0	23.8	37.8	28.9	14.5	26.0	19.3
50.5	72.5	59.2	54.6	78.7	64.0	53.4	77.1	62.5	44.7	68.8	53.2	35.8	54.1	40.8	27.1	40.7	28.9	23.6	35.1	25.1
61.0	77.7	67.8	64.6	81.6	71.3	62.7	81.9	70.5	52.4	73.1	60.5	41.4	59.4	48.1	24.6	45.1	31.1	18.6	33.7	22.2
54.9	76.7	67.3	62.2	82.6	72.2	60.9	80.1	70.5	51.2	72.6	62.1	41.4	59.2	49.8	28.5	45.3	34.4	26.9	39.6	30.5
29.6	38.8	32.5	35.8	45.8	38.1	34.3	43.2	36.8	26.5	36.8	29.4	17.4	24.7	19.2	7.4	12.6	8.8	6.0	9.5	6.1
64.6	83.5	71.7	67.9	86.0	74.6	65.5	84.0	72.4	57.8	78.8	64.9	46.8	64.6	52.4	29.0	48.1	35.4	22.9	38.6	27.8
63.7	83.0	72.9	66.5	85.5	75.9	64.8	84.0	78.2	58.6	79.0	66.2	49.2	67.4	55.6	32.8	52.0	38.2	26.6	43.5	31.2
70.5	92.0	77.3	72.7	93.0	79.4	70.1	90.2	77.0	64.8	83.1	71.3	57.4	74.6	62.8	43.2	59.7	47.9	37.9	55.1	42.9
68.4	91.3	77.7	70.3	90.5	79.3	67.4	87.3	75.7	62.0	81.3	69.2	54.4	73.9	61.4	41.3	60.0	47.1	37.3	57.0	42.7
68.7	93.8	79.9	71.7	93.2	80.4	68.9	88.5	76.6	61.2	82.6	69.9	51.3	74.4	60.5	38.8	60.4	48.0	35.8	55.4	43.9
48.0	84.7	67.4	59.3	85.2	71.2	58.3	80.9	67.9	48.0	77.6	60.6	39.7	67.9	50.6	31.0	66.6	37.7	26.3	49.3	34.6
68.5	85.8	76.1	69.2	85.5	77.1	66.4	81.0	72.9	62.1	78.1	69.7	52.8	69.2	60.0	41.4	59.0	48.8	36.8	53.5	44.6
51.1	80.1	68.0	60.1	82.3	71.8	59.5	79.2	68.7	49.7	75.3	61.3	40.1	64.7	50.3	28.6	54.6	38.6	29.1	48.8	35.9
58.6	77.9	68.1	65.7	83.3	74.3	66.0	82.8	73.7	55.6	71.8	62.3	44.1	56.6	48.0	31.3	42.2	34.7	31.1	38.4	33.4
56.7	74.0	69.9	61.6	79.7	76.9	60.0	79.1	76.9	51.1	66.5	61.5	48.0	54.4	49.5	34.2	42.4	38.0	29.4	34.3	31.6
52.0	74.2	62.8	55.0	80.0	67.1	54.4	80.5	65.3	48.3	70.1	56.1	41.0	56.8	46.6	33.5	43.0	35.9	27.8	34.5	29.5
49.4	64.0	61.9	51.4	66.9	65.1	58.6	66.6	64.2	49.2	60.8	56.6	45.4	52.6	48.6	41.2	46.0	43.0	37.4	41.4	39.9
54.1	67.3	63.7	56.3	70.3	67.8	56.0	70.1	66.5	52.2	64.8	59.8	46.8	55.0	51.0	41.4	47.9	44.3	38.2	42.5	40.3
58.5	76.3	68.8	61.3	81.4	73.1	60.2	80.3	71.8	58.8	76.7	68.8	51.4	66.1	59.7	44.1	57.2	52.2	43.6	50.8	48.1
54.3	62.5	56.8	55.1	63.7	57.4	54.8	62.8	56.7	55.8	64.4	57.8	53.9	61.5	56.8	51.0	57.0	54.4	49.5	53.3	52.1
57.5	76.7	62.4	59.7	80.8	64.0	60.5	82.3	65.9	58.3	80.1	64.1	58.5	72.5	59.5	49.1	69.0	55.5	48.2	63.7	53.3
60.5	69.7	63.2	63.1	72.1	65.4	64.7	78.8	67.1	61.7	72.0	65.1	56.8	67.8	60.1	51.4	65.6	55.3	50.9	62.7	54.2
42.1	47.3	49.1	50.6	54.6	55.9	50.1	53.1	54.3	41.3	45.3	45.1	28.2	31.5	31.0	14.8	17.5	16.7	3.5	6.1	5.6

APPENDIX 24.

Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations of the
mencement of observations

[Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time);
November 1, 1879, to December 31, 1884, at

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me	17.0	22.4	19.2	20.1	25.9	22.0	26.0	31.6	28.0	36.1	41.5	36.0	46.4	51.5	44.1
Portland, Me	19.8	27.3	22.5	22.3	30.8	25.7	29.4	37.3	31.5	40.6	48.3	41.2	52.6	59.8	52.0
Mt. Wash'ton, N. H.	4.5	6.2	5.2	6.2	7.8	6.2	9.4	12.0	10.1	19.2	22.6	20.0	31.6	36.0	32.7
Boston, Mass	23.2	30.2	25.3	24.9	32.9	27.1	31.5	38.4	32.8	41.7	48.5	41.5	55.2	61.0	52.7
Block Island, R. I.	28.1	32.2	30.0	31.4	35.7	32.8	33.7	38.8	35.1	40.7	46.4	41.3	50.6	55.0	50.0
New Haven, Conn	24.1	31.6	26.9	26.4	34.2	29.0	32.5	40.0	33.7	43.4	50.5	43.0	56.8	63.5	54.5
New London, Conn.	25.4	31.9	28.0	27.0	33.6	29.0	33.3	39.0	34.0	43.9	48.9	42.5	56.2	60.1	53.0
Middle Atlantic States:															
Albany, N. Y	20.2	26.6	22.7	22.6	29.9	25.1	29.8	36.8	31.8	42.2	50.5	42.9	56.2	65.6	55.9
New York City	27.1	33.1	29.8	28.6	35.4	30.9	33.7	41.1	35.8	43.8	52.0	45.2	55.9	64.4	56.9
Philadelphia, Pa	28.8	34.8	30.8	30.7	38.5	33.3	35.8	44.5	38.7	45.7	55.9	47.7	57.8	69.2	59.3
Atlantic City, N. J.	29.3	35.2	31.2	31.5	37.6	33.1	36.1	42.3	37.2	44.7	49.9	44.4	56.3	60.8	54.9
Barnegat City, N. J.	29.1	34.2	30.4	31.0	36.5	32.0	36.0	41.4	36.6	44.8	48.7	43.5	57.3	58.7	54.3
Cape May, N. J	31.8	36.3	33.9	33.4	39.0	35.5	37.9	42.9	39.6	45.9	51.2	47.2	58.8	62.3	57.2
Sandy Hook, N. J	28.5	33.1	30.2	29.9	35.7	31.4	34.8	40.9	36.5	43.6	50.3	44.4	56.0	63.8	56.4
Del. B'kwater, Del	33.2	37.0	34.4	36.0	42.1	37.3	37.8	43.5	39.8	45.8	51.3	47.1	57.6	63.5	58.1
Baltimore, Md	31.3	37.9	34.0	33.7	42.1	36.8	38.4	47.0	41.6	48.7	58.7	51.3	60.4	71.3	62.1
Washington City	29.4	37.5	32.0	32.1	42.8	34.9	37.2	48.2	40.6	47.7	59.8	50.2	59.8	72.2	61.2
Cape Henry, Va	38.4	42.8	40.0	41.0	46.2	42.2	44.8	50.1	46.1	52.3	57.4	52.1	62.6	68.0	61.9
Chincoteague, Va	31.5	35.9	33.0	36.8	42.7	38.1	38.9	45.2	40.8	46.9	52.4	47.3	58.6	63.6	58.2
Lynchburg, Va	32.8	42.5	35.6	35.8	47.6	39.3	39.5	53.2	44.3	50.5	63.3	53.7	62.3	74.1	63.2
Norfolk, Va	38.7	44.0	39.4	39.8	48.3	42.1	44.4	53.3	46.8	53.1	61.9	53.6	64.3	72.8	64.6
South Atlantic States:															
Charlotte, N. C	37.0	46.5	40.8	41.8	53.4	46.3	45.3	58.2	49.8	53.2	66.1	57.0	64.0	76.3	66.6
Hatteras, N. C	42.3	44.7	42.6	47.0	51.5	47.7	47.6	53.2	49.2	53.5	58.8	58.5	64.4	70.2	63.6
Kitty Hawk, N. C	39.9	44.3	41.1	42.1	47.0	43.7	45.6	52.0	46.9	52.0	57.9	52.4	62.0	68.6	61.3
Macon, Fort, N. C	41.5	47.3	42.7	46.3	54.6	48.4	47.9	55.5	50.6	54.2	61.7	53.2	65.4	73.1	65.5
Smithville, N. C	43.5	51.0	46.2	46.1	55.0	49.4	50.4	59.2	53.5	57.6	65.3	59.0	66.6	74.7	67.4
Wilmington, N. C	42.5	52.6	45.4	45.1	56.2	48.5	50.3	60.7	53.1	57.9	67.7	59.0	66.9	75.6	66.5
Charleston, S. C	45.5	53.6	48.9	48.9	58.0	52.3	53.6	63.3	57.0	60.8	69.4	63.0	70 0	77.1	71.0
Augusta, Ga	41.7	54.6	46.1	44.6	59.4	49.6	49.2	65.4	54.6	57.7	72.4	61.3	67.2	81.1	69.4
Savannah, Ga	46.6	57.6	50.8	49.4	60.8	53.8	54.6	66.0	58.3	62.8	72.3	64.2	71.2	78.7	71.0
Jacksonville, Fla	50.4	62.4	53.8	53.1	65.5	56.8	57.8	70.2	60.8	65.4	75.6	65.8	73.7	80.8	71.8
Florida Peninsula:															
Cedar Keys, Fla	54.5	62.4	57.6	58.5	66.9	61.6	60.4	68.9	64.1	67.0	75.3	69.8	72.6	81.2	74.1
Key West, Fla	67.7	73.5	69.3	69.5	75.5	70.8	71.3	77.5	72.2	75.1	80.6	75.0	78.7	83.5	77.8
Sanford, Fla	50.0	69.8	62.1	59.9	73.9	69.5	63.0	73.8	65.2	66.2	79.0	67.0	72.4	83.4	70.6
Eastern Gulf States:															
Atlanta, Ga	39.6	48.6	44.0	43.5	54.4	48.9	47.5	60.2	53.4	54.8	67.2	60.2	63.6	76.0	66.2
Pensacola, Fla	50.1	58.6	53.5	53.7	63.6	59.8	57.0	67.4	61.0	64.1	73.1	66.7	70.3	79.4	72.1
Mobile, Ala	45.8	56.3	49.7	49.8	61.5	54.0	54.7	66.6	59.0	62.0	73.9	65.1	69.6	81.7	72.0
Montgomery, Ala	43.6	54.8	48.3	46.8	60.1	52.3	51.0	65.8	57.0	58.3	72.5	63.0	67.5	81.4	71.1
Vicksburg, Miss	42.8	53.2	47.6	46.7	59.6	52.8	52.6	66.5	58.3	59.0	73.2	64.3	67.5	81.0	71.4
New Orleans, La	50.0	59.0	53.4	54.1	64.0	57.4	58.7	68.8	62.3	65.6	74.7	68.1	72.6	80.1	73.4
Western Gulf States:															
Shreveport, La	40.6	51.8	45.4	45.3	58.1	51.4	51.8	66.5	58.4	58.8	73.5	64.4	67.6	81.3	71.6
Fort Smith, Ark	26.6	38.0	31.0	35.6	46.0	41.0	42.9	59.0	50.2	51.8	67.8	58.6	62.4	77.4	66.0
Little Rock, Ark	37.8	47.5	42.2	43.4	52.6	48.1	48.2	59.8	54.2	56.0	69.6	62.5	64.1	77.1	68.9
Galveston, Tex	49.9	55.4	52.7	54.5	60.6	57.0	61.1	67.2	63.3	66.3	73.2	68.6	73.4	80.6	75.2
Indianola, Tex	49.2	56.9	52.8	54.8	62.1	56.4	61.7	69.4	64.2	66.2	74.6	68.6	73.6	80.3	74.7
Palestine, Tex	36.2	47.6	42.3	46.1	55.6	50.4	53.7	67.3	61.3	58.6	71.9	65.0	64.5	77.6	69.6
Rio Grande Valley:															
Brownsville, Tex	53.6	65.3	57.0	57.9	69.4	60.6	64.2	75.6	67.4	69.8	80.9	72.4	75.4	85.2	77.1
Rio Grande City, Tex	50.9	65.2	57.4	56.3	72.6	62.3	62.8	80.9	68.7	67.7	88.2	73.4	78.3	91.9	78.1
Ohio Valley and Tennessee:															
Chattanooga, Tenn	38.0	46.8	42.3	41.5	52.1	46.2	45.9	58.3	51 3	53.7	67.1	58.2	62.5	76.9	66.3
Knoxville, Tenn	33.0	43.0	36.5	37.0	48.8	41.7	41.0	55.3	47.3	50.5	65.5	55.7	60.1	75.7	64.0
Memphis, Tenn	35.5	44.4	40.0	39.8	50.2	45.3	46.5	57.6	52.0	55.7	67.2	60.5	66.1	77.2	69.0
Nashville, Tenn	34.6	43.7	38.4	38.5	49.3	43.1	44.0	56.2	49.1	54.1	66.7	58.1	61.7	77.1	67.2
Louisville, Ky	31.2	38.4	34.3	34.9	43.1	39.1	39.5	48.5	44.3	50.2	61.6	54.7	61.3	73.9	65.4

APPENDIX 24.

Signal Service, United States Army, for each month of the year. (*Compiled from the com-*
to December 31, 1884.)

from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from
7 a. m., 3 and 11 p. m. (Washington time).]

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
54.7	59.9	51.2	50.6	65.1	56.4	59.7	65.5	57.2	54.5	59.4	53.3	45.7	49.8	45.5	34.2	37.5	34.6	23.5	27.1	24.6
62.0	70.0	60.7	67.4	75.1	66.1	65.2	73.7	65.1	57.9	66.1	58.8	47.5	55.0	48.9	35.7	41.5	37.1	25.5	31.2	27.3
42.4	46.7	42.5	46.0	50.3	46.3	45.6	50.1	46.2	39.5	42.8	39.7	29.4	31.7	29.6	15.8	17.2	16.2	8.5	9.5	9.4
64.9	71.6	62.1	70.0	76.4	67.7	67.5	74.6	66.2	60.0	67.7	59.5	49.3	57.0	49.8	36.6	43.1	37.6	27.1	33.3	29.0
61.3	65.8	60.1	66.8	72.2	66.5	66.4	72.0	66.9	63.0	67.7	63.3	53.2	56.2	54.3	42.9	47.0	44.7	34.7	37.6	36.0
66.2	73.2	63.9	70.9	77.6	69.4	68.0	75.8	67.4	61.2	69.6	61.5	50.1	59.1	51.5	37.5	45.1	39.6	28.2	34.6	30.6
65.3	69.5	62.4	70.8	75.0	68.0	69.0	73.9	67.1	61.7	67.7	60.9	51.4	57.8	51.8	38.5	44.6	39.8	29.5	34.9	31.3
66.3	74.5	65.0	69.8	78.2	69.1	67.3	77.6	67.7	59.6	69.8	60.8	47.5	56.9	49.4	36.3	44.3	38.0	26.3	30.9	28.4
65.7	74.0	66.2	70.9	78.4	71.1	69.8	77.1	70.1	62.6	70.7	63.7	52.3	60.4	54.2	39.7	46.0	41.0	30.7	36.0	32.5
67.8	77.8	68.4	72.5	82.2	73.3	70.4	79.6	71.3	62.8	72.9	64.8	52.2	62.6	54.2	39.9	47.7	42.1	31.7	37.6	33.9
66.1	70.4	64.0	71.2	76.2	69.4	70.5	75.4	70.0	65.3	71.0	65.5	54.8	61.1	55.5	41.7	48.0	48.1	33.4	38.6	35.0
67.1	69.5	63.2	72.6	75.0	68.9	71.4	74.2	69.2	65.7	69.8	64.7	54.8	59.9	54.6	41.9	47.3	42.6	33.0	38.2	34.8
66.7	71.7	66.5	71.9	77.1	71.6	71.6	76.3	71.5	66.0	71.6	66.9	56.7	62.2	58.0	44.8	49.1	45.7	35.6	39.7	37.5
66.3	73.7	66.0	71.8	78.9	71.6	70.8	77.2	70.8	64.5	71.5	65.6	54.3	60.8	55.6	42.4	47.5	44.0	32.9	37.4	34.6
66.4	71.8	66.3	70.9	77.6	71.3	70.1	76.6	70.3	67.4	74.0	68.4	58.2	64.7	59.4	45.0	51.2	48.3	36.0	41.8	37.2
70.6	80.4	70.9	75.0	84.7	75.2	71.4	81.4	73.1	63.9	74.4	66.1	53.5	64.0	56.2	42.2	49.6	44.2	33.9	40.6	36.6
69.9	80.7	70.2	74.0	85.0	74.5	70.7	81.8	71.8	63.2	75.5	64.9	52.0	65.0	54.7	39.7	50.0	42.3	32.0	40.2	34.8
72.0	77.7	70.4	76.5	82.3	74.8	74.7	79.0	73.9	70.4	76.0	69.8	61.2	66.8	61.5	49.6	55.0	50.7	41.1	46.6	43.0
68.4	73.2	67.0	73.0	78.1	72.1	72.8	75.1	71.7	68.7	73.8	69.1	59.3	64.5	60.1	45.1	51.6	47.0	36.4	42.3	38.1
71.4	80.9	71.2	75.8	85.2	75.4	71.8	82.5	72.9	64.2	76.4	65.9	52.9	66.8	55.8	40.9	52.6	43.9	34.6	44.2	37.4
73.8	81.4	71.4	78.0	85.1	75.4	75.8	81.9	73.9	68.3	76.2	68.4	57.8	66.6	59.4	46.7	54.2	48.6	39.3	46.4	41.7
72.0	82.2	73.4	75.1	85.8	77.0	71.7	82.0	74.9	64.8	77.0	68.3	55.9	69.6	60.5	43.9	56.6	48.5	38.0	48.9	42.2
73.0	78.2	71.6	77.0	82.0	75.7	76.1	80.7	75.3	73.8	78.7	73.4	66.1	70.5	66.1	54.3	58.7	55.5	45.7	49.6	46.8
71.2	77.7	70.5	76.9	82.1	75.7	75.3	80.2	74.7	70.7	76.6	71.0	62.2	67.2	62.5	50.9	56.3	52.1	42.8	47.9	44.5
73.1	79.0	73.1	77.1	82.5	76.9	75.6	81.5	76.0	72.8	78.6	73.6	64.7	71.8	66.1	52.2	60.4	54.1	45.2	52.8	47.2
74.6	81.2	74.7	78.6	85.5	78.9	76.4	83.7	77.8	71.4	79.1	73.2	62.6	70.9	64.8	50.5	60.2	53.7	44.0	52.5	47.3
74.6	81.9	73.3	78.1	85.8	77.4	75.7	83.4	76.2	69.8	79.1	71.3	59.7	70.8	62.2	49.5	61.0	52.6	42.8	54.0	46.5
77.2	84.1	77.3	80.6	87.2	80.6	78.0	84.8	79.3	72.8	80.5	75.0	63.5	72.0	66.1	53.5	62.3	56.4	47.1	55.8	50.4
74.4	86.2	75.9	77.9	89.2	79.1	75.0	86.7	77.1	69.6	82.8	72.3	58.2	74.0	61.8	47.3	62.3	51.8	41.9	55.7	46.2
78.4	84.7	77.1	81.4	87.3	79.9	78.4	85.1	78.2	72.7	80.7	74.1	62.6	72.9	65.7	52.8	63.9	56.7	47.1	58.5	51.4
79.4	85.0	77.0	81.2	87.3	79.2	79.4	85.8	77.7	75.0	82.7	75.8	66.5	75.9	68.3	57.1	68.0	60.0	50.7	62.8	54.5
78.3	84.9	78.8	80.7	86.5	80.9	78.8	86.6	79.7	75.4	85.1	78.8	70.1	79.4	72.8	60.1	69.5	63.1	56.0	64.2	59.0
82.0	86.6	81.0	82.8	87.4	82.0	82.6	87.8	82.3	81.3	86.0	81.2	77.3	81.7	77.8	73.1	77.5	73.8	68.5	73.8	69.8
77.8	83.6	74.5	79.8	89.4	79.2	77.4	87.0	77.0	75.0	83.0	75.7	71.7	80.4	72.4	63.3	73.4	64.6	58.8	71.8	61.4
70.9	81.3	73.8	74.0	85.0	77.3	70.4	81.8	74.1	65.5	78.4	70.8	58.3	70.8	63.1	46.0	58.0	50.3	40.4	50.6	44.9
77.1	84.2	77.9	78.2	85.6	79.3	76.5	85.4	78.9	72.7	83.1	76.0	67.1	77.8	70.6	54.5	65.6	58.1	51.1	60.5	54.4
76.8	87.6	78.3	78.4	88.0	80.0	76.5	86.6	79.1	71.6	83.5	75.2	62.5	75.7	66.6	52.6	64.7	56.6	47.4	57.7	51.2
74.8	86.3	77.0	77.5	89.6	79.9	75.1	87.2	78.1	68.9	83.0	73.9	59.1	74.8	64.5	48.6	62.2	53.6	43.9	55.6	48.1
73.8	87.1	77.2	77.2	89.2	79.4	75.0	88.5	77.8	68.5	83.5	73.2	59.4	74.5	64.0	49.1	62.2	58.6	45.0	56.3	49.6
78.8	84.9	79.2	80.6	86.6	81.2	78.8	86.0	80.6	75.4	82.7	77.1	67.1	75.7	69.5	57.2	65.7	60.0	52.2	60.4	55.0
74.9	88.5	78.3	77.6	91.1	80.8	76.1	90.1	79.7	68.6	83.5	72.9	59.1	75.1	65.0	47.8	61.9	53.2	43.1	55.3	47.8
[illegible]	85.7	74.9	72.7	88.6	77.5	69.1	80.2	74.9	63.8	83.8	70.5	57.9	73.5	62.2	44.6	59.8	49.4	34.7	47.3	39.0
72.0	84.9	76.8	74.7	87.5	79.4	71.8	85.5	76.8	65.5	80.2	71.1	59.7	72.3	64.3	46.0	57.6	50.8	40.5	50.3	45.0
79.9	86.7	80.8	81.7	88.9	83.0	80.7	87.7	82.5	76.8	83.0	79.1	69.8	76.1	72.3	59.1	64.8	61.5	53.9	59.0	56.3
79.8	86.2	79.9	81.0	88.4	81.5	79.8	87.3	81.1	76.2	83.1	78.5	69.4	77.3	72.3	58.6	66.2	61.4	52.9	60.1	55.4
72.6	85.6	77.6	75.1	89.4	80.1	72.2	88.3	78.5	68.3	84.2	74.9	62.4	76.1	67.6	51.1	63.4	55.8	44.3	55.5	49.8
79.2	88.9	81.1	80.6	90.1	82.2	78.7	89.5	81.1	74.9	86.0	78.0	71.1	81.7	74.0	60.7	71.4	64.1	56.0	66.3	58.9
74.5	92.8	79.0	78.5	97.5	83.9	77.1	94.0	80.8	73.2	91.3	79.3	67.0	84.1	72.4	57.9	72.5	62.6	52.4	67.8	58.4
70.1	82.6	72.3	73.0	86.0	75.6	70.1	82.9	73.4	64.0	78.9	68.5	57.8	71.5	62.1	43.9	56.4	48.4	39.2	48.8	42.6
[illegible]	81.1	70.7	71.6	84.0	74.0	68.9	83.2	72.0	61.7	78.0	65.8	50.8	68.5	56.1	40.2	53.2	44.5	34.2	44.9	38.1
72.9	84.0	75.4	76.8	87.0	78.4	74.3	86.4	76.7	65.5	79.0	69.7	56.0	69.4	60.5	44.3	55.3	48.6	37.9	47.0	42.1
72.3	83.7	74.1	76.1	86.8	77.6	73.1	85.6	75.8	64.6	78.6	68.6	54.4	69.1	58.9	42.3	54.2	46.9	36.0	45.7	40.4
70.7	81.0	72.7	74.4	85.1	77.0	70.8	83.5	74.7	62.8	76.7	67.6	52.6	65.8	57.4	40.9	50.0	44.4	34.7	41.2	37.3

Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
Ohio Valley and Tennessee—Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Indianapolis, Ind	25.6	33.5	29.0	26.7	38.6	33.9	35.3	45.9	39.8	47.2	59.0	51.2	59.4	71.0	62.0
Cincinnati, Ohio	30.6	37.9	33.4	33.7	42.8	37.8	38.9	49.0	43.2	49.1	60.8	53.7	60.0	72.7	64.2
Columbus, Ohio	25.6	32.2	28.8	31.1	38.2	34.8	35.1	44.2	39.3	44.6	56.4	49.4	57.3	70.5	61.7
Pittsburg, Pa	28.1	34.8	31.1	29.5	38.0	32.5	33.9	43.9	37.7	44.3	57.6	48.0	55.9	70.7	59.4
Lower Lakes:															
Buffalo, N. Y	23.2	26.4	24.2	23.0	28.0	25.2	28.6	33.6	30.1	38.9	44.8	40.0	51.4	57.4	52.2
Oswego, N. Y	24.1	29.8	25.5	24.2	29.4	26.2	29.6	34.7	31.8	40.5	45.7	41.8	51.8	59.4	53.6
Rochester, N. Y	22.5	26.0	23.5	22.8	28.3	24.6	28.1	34.3	29.7	40.0	47.3	41.2	53.5	62.5	54.1
Erie, Pa	25.5	29.7	27.3	26.3	31.5	28.9	31.0	36.4	33.6	41.5	47.1	42.4	55.2	61.7	55.7
Cleveland, Ohio	24.2	28.9	25.8	25.6	31.5	28.5	31.0	37.1	33.9	42.4	48.6	44.1	54.9	62.4	57.0
Sandusky, Ohio	25.5	30.3	27.0	29.0	34.0	31.6	34.2	39.3	36.6	44.3	50.5	46.9	57.0	64.7	59.0
Toledo, Ohio	24.4	30.6	26.6	26.2	33.7	29.7	32.2	40.1	35.4	43.9	52.5	46.2	57.0	66.2	58.1
Detroit, Mich	22.2	27.5	23.9	24.1	31.3	26.5	29.4	37.5	32.2	40.8	51.1	42.3	53.5	64.7	55.4
Upper Lakes:															
Alpena, Mich	15.3	22.0	17.3	14.4	23.9	18.0	20.1	29.2	23.4	33.6	40.8	34.1	46.9	53.1	46.7
Escanaba, Mich	10.9	18.8	14.0	11.5	22.0	15.7	16.8	29.1	21.4	31.8	41.1	34.0	46.3	54.8	47.2
Grand Haven, Mich	23.4	27.3	24.8	22.9	29.9	26.0	27.9	34.9	31.0	40.6	47.5	42.4	53.6	59.2	53.5
Mackinaw City, Mich	12.3	17.8	14.2	9.8	18.6	13.9	14.3	26.8	19.6	33.2	41.6	35.1	43.4	51.2	44.6
Marquette, Mich	14.3	20.7	16.4	14.2	23.6	17.6	19.9	29.5	23.1	33.8	41.9	35.3	47.8	55.0	47.8
Port Huron, Mich	18.8	25.0	20.9	20.9	28.0	23.7	26.3	33.0	29.0	38.5	44.7	39.2	50.6	58.3	50.9
Chicago, Ill	21.6	28.2	24.3	25.1	32.6	28.9	31.3	38.0	34.8	42.2	48.7	45.0	54.5	60.4	55.6
Milwaukee, Wis	17.3	23.8	20.1	20.6	28.2	24.7	27.0	34.2	30.7	39.1	45.2	41.8	51.2	56.8	52.4
Duluth, Minn	6.6	16.4	11.2	11.4	22.3	17.1	18.4	30.6	24.5	33.8	43.1	37.4	45.3	53.8	47.4
Upper Mississippi Valley:															
Saint Paul, Minn	8.4	17.3	12.1	12.4	24.4	17.5	22.5	34.7	28.2	38.0	51.8	43.9	53.0	66.1	57.3
La Crosse, Wis	11.0	20.7	16.0	16.6	28.0	22.8	25.8	36.8	32.1	40.6	52.8	46.8	54.6	67.0	60.0
Davenport, Iowa	17.6	26.0	21.5	22.4	32.9	27.7	30.2	40.5	35.1	43.2	55.6	48.4	56.9	66.0	60.5
Des Moines, Iowa	15.1	25.1	20.1	20.2	31.4	25.5	29.3	41.4	34.8	41.9	57.0	48.8	54.1	69.1	60.4
Dubuque, Iowa	13.8	24.4	19.4	18.8	31.1	25.1	27.5	39.4	33.1	41.4	55.2	47.0	55.0	68.6	59.6
Keokuk, Iowa	20.3	29.5	24.5	25.5	26.0	30.3	32.6	43.9	37.3	45.5	58.1	50.3	58.2	70.1	62.0
Cairo, Ill	31.4	39.8	35.2	36.2	45.6	40.6	42.6	52.8	47.2	52.9	64.2	57.7	63.1	74.5	66.4
Springfield, Ill	25.1	31.2	27.0	30.2	38.2	33.7	35.3	45.1	39.6	47.1	59.2	52.5	57.9	69.8	63.6
Saint Louis, Mo	27.4	35.7	30.7	31.3	41.1	36.0	37.3	49.1	42.0	48.8	61.9	54.3	60.5	72.8	64.7
Missouri Valley:															
Leavenworth, Kans	21.2	31.2	25.8	26.1	39.1	32.5	34.0	48.2	40.4	46.1	61.2	52.6	58.4	72.2	63.9
Omaha, Nebr	15.8	26.5	20.6	21.0	33.2	26.8	29.2	42.6	35.1	42.8	57.6	49.0	56.2	69.8	61.0
Bennett, Fort, Dak	8.3	17.8	10.6	9.0	23.2	16.4	21.4	35.7	28.0	34.9	51.6	42.4	48.2	65.6	55.8
Huron, Dak	4.5	15.9	9.1	8.4	21.5	13.3	22.5	33.3	27.4	30.0	51.7	43.0	45.7	60.7	51.9
Yankton, Dak	9.4	22.5	14.2	13.6	27.5	19.6	23.4	37.1	28.9	37.5	53.9	43.6	52.9	67.5	57.6
Extreme Northwest:															
Moorhead, Minn	−8.4	3.2	−2.8	−0.3	11.4	5.8	9.7	23.2	17.5	31.4	44.7	37.5	45.5	59.3	52.6
St. Vincent, Minn	−10.8	−1.8	−7.8	−5.1	6.6	0.5	5.7	19.4	13.1	27.1	40.4	33.0	44.1	59.7	50.0
Bismarck, Dak	0.3	12.2	5.0	5.7	18.2	10.2	15.5	28.7	20.8	33.0	48.0	38.8	48.0	63.5	53.3
Buford, Fort, Dak	2.0	13.5	5.2	3.1	16.5	8.2	15.6	29.9	21.2	32.0	50.2	39.2	45.2	63.7	54.1
Northern Slope:															
Assinaboine, Fort, Mont	8.0	13.6	9.8	9.3	16.8	14.1	23.0	34.4	28.3	32.9	50.2	41.2	43.6	61.0	52.8
Benton, Fort, Mont	11.9	21.3	14.7	13.1	26.0	19.1	25.6	42.8	31.8	32.3	52.2	40.9	42.7	64.3	52.6
Custer, Fort, Mont	12.0	23.6	16.6	14.4	26.8	20.1	28.9	39.7	31.5	33.8	53.7	44.5	44.6	64.1	54.8
Helena, Mont	11.7	17.9	15.4	15.7	23.6	19.9	28.2	38.7	33.4	35.3	47.8	41.1	44.1	58.6	51.9
Maginnis, Fort, Mont	14.2	20.4	17.6	9.4	18.4	12.8	24.4	35.9	26.2	31.7	45.6	35.3	42.4	56.4	44.0
Poplar River, Mont	−5.3	9.3	2.6	−11.2	1.7	−4.1	20.5	38.6	26.9	30.5	47.9	37.4	45.0	68.2	51.9
Shaw, Fort, Mont	14.2	21.1	16.6	15.7	24.8	18.6	24.8	41.2	30.8	30.5	49.1	39.0	40.0	59.8	50.0
Deadwood, Dak	17.6	29.2	20.1	19.0	30.6	22.4	25.4	39.3	30.4	32.8	46.2	38.4	43.3	55.8	47.9
Cheyenne, Wyo	20.0	32.5	22.5	21.8	36.6	25.3	25.9	42.9	30.9	31.1	49.6	37.7	42.3	61.3	48.9
North Platte, Nebr	12.7	30.0	18.7	18.0	36.6	24.7	27.0	45.4	34.4	38.3	57.5	45.8	51.0	67.2	57.1
Middle Slope:															
Denver, Colo	20.7	36.0	25.9	24.5	40.9	30.5	30.8	49.2	39.2	36.6	58.4	46.1	47.0	66.1	56.3
Pike's Peak, Colo	0.6	5.4	2.1	1.0	6.9	2.9	4.1	12.0	6.5	8.6	17.4	11.6	18.3	26.7	20.8
West Las Animas, Colo	10.8	35.2	19.6	15.0	39.9	25.7	28.0	54.1	40.6	36.3	61.0	48.0	47.4	68.8	55.5
Dodge City, Kans	19.8	35.1	25.5	24.6	43.3	32.0	32.0	53.0	40.8	42.9	64.2	51.1	54.9	73.0	61.1
Elliott, Fort, Tex	23.7	41.8	29.8	26.6	45.8	34.1	36.4	56.8	44.2	44.3	67.4	54.9	54.0	72.6	62.7
Southern Slope:															
Sill, Fort, Ind. T	30.3	44.0	35.7	35.3	50.9	41.8	43.7	62.7	51.6	52.8	72.7	61.2	62.7	78.5	68.1
Concho, Fort, Tex	34.9	53.4	40.8	39.4	59.1	46.5	47.8	70.3	56.2	53.8	77.4	62.3	68.6	84.2	70.2
Davis, Fort, Tex	33.6	54.8	41.8	38.0	60.3	46.9	48.2	67.2	53.8	49.8	72.2	50.8	58.9	79.8	66.9
Stockton, Fort, Tex	34.4	55.5	40.0	38.8	61.0	47.0	45.7	70.0	55.7	51.8	77.6	62.2	64.1	84.4	70.8
Southern Plateau:															
El Paso, Tex	36.7	53.7	44.7	41.4	60.4	49.6	45.8	68.0	56.4	51.4	75.3	62.4	59.6	85.2	72.0
Apache, Fort, Ariz	23.0	46.0	32.3	27.0	50.3	37.4	32.4	58.2	43.5	35.0	65.1	49.5	40.0	73.8	57.0

of the Signal Service, United States Army, for each month of the year, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
68.5	79.1	70.2	72.4	83.0	74.0	68.7	81.8	71.9	59.8	73.8	64.0	49.7	62.4	54.3	36.5	45.6	40.2	29.2	36.1	32.8
68.5	80.7	72.5	73.3	84.8	76.6	70.3	82.5	74.5	62.5	75.3	67.0	52.4	64.4	56.7	40.5	49.3	43.5	33.5	40.7	36.3
66.2	77.4	69.3	70.4	82.2	73.7	66.5	80.0	65.4	60.1	74.1	64.5	51.2	63.4	55.3	37.0	46.6	40.8	29.7	35.1	31.8
65.4	78.9	68.1	68.5	82.3	70.8	65.3	81.1	69.2	58.4	73.9	62.4	49.0	62.0	52.0	37.3	45.4	39.2	30.7	36.5	32.5
63.6	68.5	63.0	67.3	73.4	68.2	66.2	74.2	67.5	59.2	66.9	60.4	48.3	54.7	49.7	35.7	39.8	36.7	27.7	30.5	28.9
62.1	69.2	62.3	67.5	74.5	68.0	66.7	74.4	68.0	59.3	67.3	60.8	48.8	55.2	50.3	37.2	40.5	38.2	28.3	31.5	29.5
63.2	71.8	63.0	67.6	76.5	67.5	65.6	75.6	66.5	58.7	67.9	59.6	47.4	55.3	48.7	34.4	39.5	35.0	26.4	29.8	27.5
65.5	72.2	65.2	70.0	76.1	70.0	67.9	75.3	68.3	61.3	68.5	62.5	50.9	57.3	52.5	38.6	43.1	39.8	30.9	34.3	32.6
64.8	72.3	65.9	69.0	76.4	69.8	66.8	75.5	68.7	59.7	69.1	62.2	49.4	58.2	52.2	36.5	42.1	38.0	28.2	32.2	29.5
65.2	72.4	66.5	70.0	77.4	72.0	68.4	76.4	71.0	61.9	70.4	64.4	52.3	59.6	54.8	38.5	44.3	40.2	31.0	34.4	32.0
67.2	75.2	67.3	70.5	79.7	71.5	67.5	77.8	69.9	59.4	70.5	62.4	49.1	58.9	52.5	36.3	43.1	38.8	28.3	33.4	30.4
63.5	73.9	65.0	67.0	78.4	69.1	65.3	77.0	68.3	58.0	69.3	60.9	47.7	57.4	50.8	35.0	41.0	36.8	26.9	31.3	28.4
57.9	63.7	56.9	63.2	70.2	62.8	61.3	70.0	62.0	53.8	62.3	54.9	42.3	49.9	44.0	30.3	34.9	31.2	21.6	26.1	22.9
57.7	65.8	58.3	63.1	72.6	63.8	61.1	70.9	63.1	52.6	61.9	55.0	42.0	49.2	44.2	28.3	34.4	30.4	18.1	23.7	20.1
63.5	68.5	62.0	68.1	73.2	66.8	65.8	72.8	66.2	58.1	65.6	59.3	47.5	54.7	49.7	35.1	39.7	37.0	27.8	30.8	29.1
58.0	64.9	56.8	59.8	66.4	59.4	59.6	67.4	59.4	55.2	62.3	55.9	46.1	52.1	47.5	33.9	38.0	35.2	24.3	26.9	25.2
57.0	63.6	56.4	63.0	70.6	62.0	62.0	70.7	62.2	58.5	62.4	54.1	43.0	50.1	44.5	28.7	34.3	30.4	20.2	24.7	21.4
60.6	68.0	60.4	65.6	73.5	65.8	64.1	73.4	65.9	57.4	67.1	59.2	46.4	54.8	48.8	33.4	39.5	34.8	24.8	29.4	26.4
63.3	69.1	64.0	69.5	76.0	70.9	68.2	75.8	70.8	59.8	69.2	63.6	48.7	57.5	52.2	35.3	42.1	38.3	26.7	32.4	29.2
61.0	66.9	61.4	66.3	73.4	66.9	65.4	73.6	67.2	56.9	66.1	59.9	45.7	54.2	48.4	31.4	37.8	34.3	21.6	27.2	24.3
55.1	63.3	56.6	62.0	72.6	64.3	62.1	71.8	63.7	52.2	61.7	54.9	41.3	49.7	44.4	25.2	32.4	27.9	12.1	20.4	15.2
61.7	73.9	65.4	65.7	79.4	69.8	63.4	77.7	68.0	52.6	66.6	57.4	42.3	53.8	45.7	26.4	35.0	29.5	15.0	22.4	17.8
63.4	74.9	68.1	67.4	79.6	72.5	65.0	78.2	70.3	56.0	67.8	60.7	45.3	55.6	49.8	29.7	37.8	33.0	18.8	26.1	22.5
65.6	76.5	69.2	69.6	81.5	73.9	67.4	80.2	72.2	58.3	71.7	63.0	47.5	59.2	52.0	33.0	42.2	36.7	24.1	31.2	27.1
66.6	76.9	68.2	67.0	81.4	72.0	66.1	81.3	71.6	57.0	72.2	62.4	47.3	60.8	51.8	32.1	43.2	36.3	20.0	28.1	22.8
66.3	75.5	67.0	68.5	81.8	72.2	65.7	80.3	70.2	56.7	70.4	61.0	46.1	58.1	50.5	30.6	40.6	34.7	21.4	29.6	25.2
68.3	78.6	70.4	72.7	84.0	75.1	69.5	83.1	73.3	60.3	74.1	64.5	49.0	62.0	53.6	34.0	44.0	37.7	24.9	32.6	28.3
71.3	81.6	73.4	75.3	85.5	77.6	73.0	84.6	75.8	63.5	77.4	67.9	53.7	67.9	58.0	41.1	51.5	45.4	34.2	42.6	37.8
66.6	77.6	70.2	70.7	83.2	74.8	67.6	81.7	72.8	59.3	74.6	65.0	52.1	64.0	56.4	37.5	46.9	41.2	28.8	34.8	31.6
68.5	81.0	73.2	73.7	85.1	77.3	70.9	83.8	75.6	62.0	76.0	67.5	51.6	65.3	56.8	38.0	48.1	42.3	30.4	38.1	34.0
66.3	81.0	72.4	72.1	85.0	76.6	69.4	84.4	75.0	60.1	75.8	65.6	48.5	64.4	54.8	34.4	46.8	38.8	25.6	35.6	29.4
66.2	78.7	70.0	70.4	83.4	74.6	67.9	82.4	72.8	56.6	72.1	62.8	45.7	61.0	51.8	30.3	42.2	35.1	20.2	29.8	24.0
63.1	77.6	66.8	62.9	80.7	68.8	61.2	83.4	70.5	50.2	72.0	58.2	38.0	56.3	44.6	21.3	38.6	27.6	12.1	25.4	17.2
58.8	74.9	65.1	61.1	76.8	66.9	60.0	78.6	67.4	49.4	68.7	55.7	39.7	55.4	45.3	24.4	38.1	28.7	12.8	25.0	15.8
63.6	76.7	66.4	67.0	81.4	71.6	64.0	82.0	70.7	52.6	72.0	59.0	41.3	58.9	47.2	25.8	40.5	30.0	15.2	27.1	18.9
57.5	73.3	63.5	59.4	74.8	65.0	58.2	75.5	64.7	47.4	64.9	53.7	36.0	49.9	41.9	18.6	30.1	22.2	5.2	15.2	8.6
55.0	71.0	60.4	56.0	72.6	61.8	55.1	73.3	61.8	44.4	62.2	50.5	33.7	46.7	38.5	15.6	24.3	18.0	2.0	9.6	3.7
57.6	72.3	61.6	61.8	78.5	67.8	58.9	78.2	66.3	46.9	66.6	53.9	35.7	53.0	41.1	19.7	31.9	23.7	9.1	18.8	12.0
55.8	73.3	62.6	58.0	77.5	64.9	55.6	79.0	65.3	43.6	66.6	52.0	34.8	51.4	40.2	19.5	31.6	23.1	3.8	14.1	6.2
54.4	71.9	64.2	56.2	75.7	66.8	55.6	75.4	66.0	44.9	61.9	52.8	34.5	46.9	39.9	23.3	33.9	27.9	14.3	20.4	16.2
52.5	73.2	62.9	58.6	79.6	68.2	57.5	79.4	68.6	45.6	65.5	55.2	34.2	50.2	41.0	23.8	37.8	28.9	14.5	26.0	19.3
56.6	73.6	64.4	58.9	80.1	70.8	58.3	80.9	70.9	45.7	68.8	57.7	36.5	55.7	45.2	23.4	41.3	29.8	12.9	24.6	16.9
52.8	68.0	61.4	59.7	78.2	66.8	59.9	78.5	68.1	50.1	61.5	56.3	37.5	47.0	42.3	25.9	33.3	29.4	17.9	23.3	20.0
52.8	68.0	56.2	54.8	70.2	56.8	55.8	75.0	59.7	44.6	61.3	48.7	34.3	46.9	37.4	27.7	39.5	31.4	17.0	25.0	18.3
52.4	80.2	66.5	55.3	78.9	62.7	55.3	77.4	63.8	44.2	66.4	52.4	30.5	55.4	42.1	14.4	32.8	23.2	—6.3	4.2	—4.0
49.9	69.2	60.0	51.5	74.6	63.5	50.5	75.5	68.8	43.1	62.9	51.1	35.0	48.0	39.0	26.0	37.0	29.0	18.0	26.2	20.3
54.4	67.9	58.6	56.9	72.0	62.4	55.9	72.9	61.7	46.3	63.7	52.0	39.0	51.1	42.2	27.4	38.4	30.8	17.4	27.0	20.0
51.6	73.5	59.2	56.5	79.3	65.3	54.1	77.6	70.6	44.4	69.1	52.9	35.8	55.7	41.1	27.7	41.5	29.8	22.7	34.7	24.7
60.4	78.0	66.6	65.6	83.2	71.7	63.1	82.8	70.2	51.7	73.7	59.8	40.1	61.3	47.6	25.4	45.9	31.9	18.2	35.1	22.3
54.1	77.8	66.6	61.7	83.1	71.7	60.0	81.0	70.0	49.9	72.8	60.6	40.3	61.4	49.4	29.6	47.7	35.4	23.9	38.7	27.8
28.8	37.7	31.5	36.3	45.4	38.1	34.7	43.9	37.1	27.1	36.8	29.9	18.0	25.9	20.1	8.4	18.7	10.1	4.5	8.5	5.2
58.6	80.5	67.5	63.2	88.1	74.0	60.2	84.7	71.5	52.4	79.5	64.4	42.0	65.7	52.0	28.6	58.8	38.3	19.8	40.8	26.4
65.6	83.1	70.6	69.3	87.5	75.0	66.9	85.2	73.0	58.0	78.8	65.0	45.9	66.6	53.2	30.0	49.7	36.6	23.1	40.2	28.6
63.7	83.0	72.9	66.5	85.5	75.9	64.8	84.0	73.2	58.6	79.0	66.2	49.2	67.4	55.6	32.8	52.0	38.2	26.4	43.9	31.2
70.6	86.7	76.1	73.5	90.7	79.7	71.0	89.7	78.0	63.4	83.8	71.5	54.3	72.8	61.1	39.5	57.0	45.6	30.4	45.8	36.0
71.1	91.2	77.5	74.1	93.0	80.4	70.2	90.7	77.8	64.6	83.4	71.8	56.7	76.6	62.2	43.4	61.5	48.8	37.6	55.8	43.1
66.6	85.6	72.9	67.6	84.8	73.6	63.7	80.6	70.3	58.2	76.9	65.9	52.2	71.5	59.5	40.4	60.7	48.7	35.0	56.0	42.8
68.7	90.2	77.8	71.0	91.5	79.8	67.9	88.5	76.8	62.2	82.9	70.4	54.2	74.8	61.7	41.8	62.2	47.7	36.8	56.8	43.0
68.5	92.9	80.0	73.0	92.8	80.8	69.9	89.1	77.5	62.2	83.8	71.5	58.4	75.7	61.7	41.4	61.5	49.0	37.8	55.9	45.2
46.6	85.0	67.1	60.2	85.2	71.4	58.9	81.6	68.7	49.1	78.5	61.3	39.5	60.1	51.0	27.6	56.7	38.4	26.3	49.1	34.0

Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
Southern Plateau—Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Grant, Fort, Ariz	35.0	50.1	44.2	39.0	53.4	45.0	43.4	60.4	51.5	47.9	67.5	57.4	56.7	77.1	66.2
Prescott, Ariz	23.4	45.0	32.8	25.7	47.4	37.1	31.2	55.8	42.5	36.8	61.7	48.8	42.8	70.1	56.0
Thomas, Camp, Ariz	29.9	50.1	40.5	36.2	56.3	47.7	41.6	63.6	54.6	44.9	72.5	60.9	52.1	83.2	69.9
Yuma, Ariz	45.6	62.5	52.8	49.9	67.8	57.7	53.6	75.0	65.1	56.4	80.7	70.0	64.3	89.0	77.9
Middle Plateau:															
Salt Lake City, Utah	25.0	33.2	27.9	28.4	38.2	32.2	36.1	47.9	41.1	42.0	55.6	48.5	49.9	64.9	56.9
Northern Plateau:															
Boisé City, Idaho	22.7	34.2	30.5	27.5	38.1	34.7	35.3	49.9	44.6	40.5	57.4	51.7	46.7	65.9	58.2
Lewiston, Idaho	29.0	34.0	31.8	26.4	34.2	30.8	37.1	48.3	44.3	43.0	57.3	52.2	48.9	66.0	60.9
Dayton, Wash	28.2	35.2	29.3	24.0	35.8	27.5	35.2	50.9	41.0	40.5	58.2	47.9	45.7	67.0	55.0
Spokane Falls, Wash	19.7	26.4	24.9	19.0	27.8	25.7	31.8	43.7	40.5	39.4	54.0	48.8	45.0	63.5	58.6
North Pacific Coast:															
Canby, Fort, Wash	41.6	43.1	43.0	35.1	40.0	39.4	41.3	46.5	44.3	48.0	52.8	50.6	50.7	56.2	53.3
Olympia, Wash	35.6	40.3	38.1	35.4	41.4	38.7	39.0	48.2	45.2	41.6	53.4	49.3	44.7	59.3	55.6
Tatoosh Island, Wash	39.9	42.2	42.4	35.3	37.1	37.4	41.3	44.4	42.4	47.2	51.3	49.0	48.5	53.1	51.0
Portland, Oreg	36.9	42.4	39.4	38.1	45.1	41.8	42.2	51.6	47.7	41.6	57.7	52.5	48.7	62.7	57.7
Roseburg, Oreg	37.1	42.8	40.4	37.3	47.1	42.8	40.5	52.4	48.9	43.2	57.0	52.0	45.9	63.2	57.6
Middle Pacific Coast:															
Cape Mendocino, Cal	44.4	48.4	46.7	41.8	47.3	44.7	45.9	51.6	48.5	45.4	50.9	47.3	48.8	54.1	50.0
Red Bluff, Cal	40.3	49.7	46.2	42.7	53.0	49.4	46.9	60.5	55.5	50.5	65.6	59.9	56.3	74.2	67.5
Sacramento, Cal	41.1	49.9	46.8	44.0	53.3	50.5	48.6	59.4	55.4	51.0	63.5	58.5	55.0	70.3	64.5
San Francisco, Cal	47.8	53.0	51.0	48.5	54.9	51.8	49.9	57.4	53.0	50.6	59.0	53.4	52.2	61.6	55.3
South Pacific Coast:															
Los Angeles, Cal	45.6	60.6	51.1	46.9	61.8	52.5	48.5	63.6	54.2	50.8	66.7	56.0	53.8	71.7	59.8
San Diego, Cal	48.1	60.6	52.6	49.3	60.4	53.6	50.9	61.3	54.9	52.6	63.6	57.0	56.7	66.2	60.1
Alaska Stations:															
Saint Michael's, Fort, Alaska	4.8	8.2	7.6	—3.5	0.1	0.7	5.0	10.5	11.8	13.8	20.6	23.2	28.4	34.9	36.3
Sitka, Alaska	36.3	37.7	36.8	31.0	34.1	33.0	34.7	39.2	37.2	38.9	45.6	43.9	43.6	49.0	47.9
Unalashka, Alaska	31.3	34.0	33.7	31.5	33.3	32.2	30.7	33.8	33.4	32.0	36.7	36.0	36.9	40.8	41.6
Behring's Island, Behring Sea	25.5	25.4	26.3	28.2	28.3	30	26.0	25.8	28.4	28.0	29.0	32.0	34.2	35.6	38.1

of the Signal Service, United States Army, for each month of the year, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
66.2	86.1	76.0	69.8	85.9	77.8	67.5	82.5	73.9	62.9	79.8	70.5	53.6	70.7	60.9	42.1	58.9	49.1	37.2	53.3	44.6
51.5	81.0	67.6	61.0	84.0	73.0	59.5	80.8	69.5	50.1	76.6	62.4	40.1	60.0	50.7	29.3	55.4	38.8	26.7	48.7	34.8
61.6	94.1	80.9	71.3	94.8	83.6	70.0	90.5	80.1	59.7	85.3	73.2	46.6	74.0	60.9	35.1	61.1	47.8	33.2	53.8	43.0
71.4	98.8	86.8	80.4	103.3	93.1	80.1	101.4	91.0	71.8	96.0	83.7	61.6	83.6	70.8	51.6	71.5	56.2	47.3	65.4	54.8
59.4	76.8	66.9	66.5	84.8	74.6	65.9	83.8	74.1	55.9	73.5	63.1	46.0	59.2	50.3	33.9	44.7	37.6	29.2	37.4	31.7
54.0	76.1	68.7	58.5	83.5	75.2	58.0	83.3	75.1	48.0	66.6	61.4	38.3	56.0	48.8	31.3	44.2	38.3	26.2	36.5	32.1
56.7	74.0	69.9	61.6	79.7	76.9	60.0	79.1	76.9	51.1	66.5	61.5	43.0	54.4	49.5	34.2	42.4	38.0	29.4	34.3	31.6
52.0	74.2	62.8	55.0	80.0	67.1	54.4	80.5	65.3	48.3	70.1	56.1	41.0	50.8	46.6	33.6	43.0	35.9	27.7	34.3	29.4
53.2	70.8	67.3	55.6	76.2	72.0	54.3	76.8	70.7	46.2	63.8	57.0	38.7	49.8	45.3	31.8	30.5	34.6	24.0	30.6	28.0
52.9	57.3	55.4	56.0	61.7	58.2	58.0	64.0	60.1	55.6	60.2	57.2	50.1	53.6	51.0	47.8	50.6	49.0	39.0	41.9	40.2
49.3	64.6	61.6	51.6	67.8	64.8	53.1	68.6	64.5	49.0	61.6	56.4	45.1	53.1	48.8	41.1	46.9	43.5	37.7	41.8	39.9
50.6	55.8	53.4	52.9	58.8	55.6	53.3	58.8	57.0	50.9	54.5	53.2	47.6	50.5	49.2	45.6	47.1	46.8	38.4	40.0	39.8
53.7	68.2	63.5	56.7	72.6	68.8	56.1	71.9	67.2	52.7	67.6	61.4	47.7	58.4	52.5	42.2	48.7	44.8	38.4	43.3	40.8
51.1	69.3	63.9	53.8	73.6	68.9	53.1	73.1	68.1	49.6	68.6	62.2	44.2	56.3	50.4	39.8	47.1	43.6	38.5	43.6	41.0
51.8	57.6	54.2	51.2	56.0	54.2	52.5	57.1	55.4	54.6	60.0	56.9	50.7	55.8	53.3	49.2	53.7	51.2	47.5	50.3	49.4
63.7	84.8	79.4	68.4	91.4	80.3	67.1	90.9	84.2	61.1	80.6	73.8	53.2	70.0	62.3	45.5	59.6	52.2	41.8	51.6	47.0
59.0	77.9	70.2	60.8	82.8	73.8	60.2	82.3	73.0	58.7	78.7	69.8	51.5	68.5	61.0	44.0	58.5	53.0	42.4	51.5	47.6
54.4	64.0	57.4	54.7	63.3	56.9	55.1	63.5	57.2	55.7	65.2	58.3	55.1	64.0	58.4	52.3	59.0	55.7	49.0	53.9	52.1
58.1	75.9	66.2	60.2	80.0	64.7	60.9	81.4	66.2	58.4	79.3	64.8	54.1	73.1	60.2	49.5	68.9	55.9	47.9	63.3	52.9
60.5	69.6	63.2	63.5	72.5	65.7	65.0	73.9	75.1	62.5	72.1	65.4	58.0	69.0	61.3	52.6	65.7	56.6	50.0	62.5	54.1
41.6	47.8	49.2	50.1	55.1	55.9	44.6	48.6	49.2	41.3	45.8	45.1	28.2	31.5	31.0	14.8	17.5	16.7	8.5	6.1	5.6
48.1	53.2	52.3	50.8	55.8	54.8	52.2	58.2	57.0	49.2	54.2	52.2	42.9	47.4	45.6	39.0	40.6	39.4	34.7	35.8	35.2
43.3	47.3	47.6	47.8	50.7	51.4	48.3	53.0	53.0	45.6	49.8	49.3	38.7	42.4	42.1	33.4	36.3	35.7	32.0	32.2	32.0
40.0	41.6	45.0	45.4	46.8	50.0	50.3	51.1	54.1	45.3	46.5	49.8	37.6	38.0	39.6	33.9	30.0	30.3	27.6	28.0	28.2

APPENDIX 25.

Average temperature (in degrees Fahrenheit) of the surface of the ocean at stations of the Signal Service, United States Army, on the Atlantic and Gulf coasts for each month and the year. (Computed from observations taken at 2 p. m. (Washington time) daily, and from the date observations began to December 31, 1884.)

Stations.	Observations began.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
		°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me	May, 1874	35.7	33.0	32.7	35.4	39.1	42.9	46.7	49.6	50.5	49.7	46.0	40.7	41.8
Portland, Me	December, 1873	33.4	32.0	33.7	39.3	47 0	55.0	59.5	60.9	58.0	52.4	44.5	36.8	46.0
Boston, Mass	May, 1881	33.2	32.4	35.1	42.4	51.8	60.3	64.2	64.2	62.8	54.9	43.9	35.8	48.4
Block Island, R. I	May, 1881	36.1	35.8	37.4	42.8	49.8	58.6	65.3	67.0	64.9	57.7	49.5	41.9	50.6
New London, Conn	April, 1874	36.0	35.3	38.7	46.6	56.3	66.6	71.4	72.0	67.9	59.8	49.6	40.4	53.4
New Haven, Conn	May, 1881	32.4	33.0	36.5	45.5	56.4	66.5	72.1	73.1	68.8	58.6	46.2	37.8	52.2
New York City	December, 1873	33.3	32.7	35.8	43.7	54.8	66.0	72.4	73.0	69.3	60.0	48.3	38.3	52.3
Sandy Hook, N. J	May, 1881	37.3	36.7	39.2	44.4	53.3	63.4	71.0	72.9	70.0	61.4	50.9	42.0	53.5
Atlantic City, N. J	May, 1881	36.6	38.3	40.5	47.4	56.1	65.3	71.6	71.3	71.2	63.3	51.6	41.1	54.5
Delaware Breakwater, Del	March, 1880	36.5	37.9	41.5	47.9	57.9	66.6	71.7	72.6	71.5	63.9	53.3	41.9	55.3
Chincoteague, Va	May, 1880	37.2	41.8	44.1	52.3	65.6	75.3	80.0	78.6	75.8	66.6	51.7	42.0	59.2
Norfolk, Va	December, 1873	41.0	45.1	50.2	56.2	67.5	76.0	80.8	80.4	74.9	65.4	54.4	43.8	61.3
Fort Macon, N. C	July, 1883	46.9	57.3	58.2	60.6	72.4	76.3	81.4	79.8	77.3	70.6	61.4	53.2	66.3
Wilmington, N. C	December, 1873	47.6	50.8	56.0	62.6	71.6	78.9	83.7	81.2	76.0	69.3	59.4	49.7	65.6
Smithville, N. C	December, 1879	46.7	51.8	56.5	62.4	72.3	78.6	83.2	81.8	78.6	71.2	60.8	53.5	66.4
Charleston, S. C	April, 1874	50.9	53.6	58.5	64.4	73.1	80.0	83.7	83.3	78.9	71.8	59.3	53.4	67.5
Savannah, Ga	December, 1873	49.9	54.1	58.9	64.5	72.9	80.0	84.5	82.9	78.5	71.5	60.5	50.8	67.4
Jacksonville, Fla	December, 1873	57.8	61.4	66.9	71.3	78.4	63.5	86.6	85.5	82.2	75.5	67.5	59.4	73.0
Key West, Fla	June, 1874	71.8	73.8	75.7	78.7	82.6	86.1	87.3	86.4	85.9	81.4	76.7	71.6	79.8
Cedar Keys, Fla	December, 1879	60.2	64.9	67.3	72.5	79.1	83.0	85.8	85.5	84.1	77.6	67.0	61.9	74.1
Pensacola, Fla	April, 1881	55.8	62.6	65.0	71.1	78.5	83.0	85.0	84.7	82.5	77.1	65.2	58.5	72.4
Mobile, Ala	December, 1873	50.5	54.2	59.6	65.5	74.2	82.4	85.7	84.9	81.9	74.6	63.7	53.6	69.2
Galveston, Tex	December, 1873	54.8	57.7	64.1	70.8	78.2	84.2	86.4	85.6	81.5	75.8	64.1	57.7	71.7
Indianola, Tex	May, 1874	54.1	59.8	66.0	71.6	78.2	84.5	86.4	87.0	82.7	77.9	65.4	59.8	72.8

APPENDIX 26.

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, United States Army, for each season of the year. (Computed from the commencement of observations at each, to and including December, 1884.)

[The mean temperature is deduced from the three telegraphic observations, taken at the same moment of Washington time at all stations. The seasons comprise the following months: Spring: March, April, and May; summer: June, July, and August; autumn: September, October, and November; and winter: December, January, and February. Observations prior to Aug. 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from Aug. 25, 1872, to Nov. 1, 1879, at 7.35 a. m., 4.35 and 11.00 p. m. (Washington time), and from Nov. 1, 1879, to Dec. 31, 1884, at 7.00 a. m., 3.00 and 11.00 p. m. (Washington time).]

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
New England:		°	°	°	°	*Inches.*	*Inches.*	*Inches.*	*Inches*
Eastport, Me	Apr. 1, 1873	37.9	58.8	46.0	22.4	13.48	12.48	12.92	11.34
Portland, Me	Jan. 15, 1871	43.6	67.8	49.8	26.3	9.54	10.56	10.27	9.68
Mount Washington, N.H.	Dec. 1, 1870	21.5	46.3	29.1	7.0	19.49	27.98	22.87	13.60
Boston, Mass	Nov. 1, 1870	44.8	69.0	51.2	28.2	12.49	11.95	12.31	11.50
Block Island, R. I	Sept. 1, 1880	43.5	66.4	55.0	33.2	13.50	12.28	12.78	16.30
New Haven, Conn	Dec. 10, 1872	46.4	70.2	52.9	29.5	13.04	13.92	11.66	12.19
New London, Conn	Jan. 10, 1871	45.6	68.9	52.7	30.1	12.43	13.30	11.67	11.27
Middle Atlantic States:									
Albany, N. Y	Dec. 22, 1873	45.8	70.6	51.2	25.9	8.70	11.96	9.13	8.33
New York City	Nov. 1, 1870	47.7	71.5	54.6	31.5	10.16	12.86	10.15	10.25
Philadelphia, Pa	Jan. 1, 1871	50.5	73.7	55.4	33.4	9.25	12.94	9.53	9.21
Atlantic City, N. J	Dec. 10, 1873	47.4	70.4	56.2	33.9	10.07	11.61	9.75	11.80
Barnegat City, N. J	Dec. 10, 1873	46.9	70.1	55.7	33.1	11.51	12.68	12.74	13.27
Cape May, N. J	May 24, 1871	49.0	71.6	57.8	35.8	10.95	12.72	11.16	12.46
Sandy Hook, N. J	Dec. 10, 1873	47.4	71.9	56.2	32.6	14.03	13.45	12.18	11.60
Del. Breakwater, Del	Jan. 28, 1880	49.4	71.3	59.4	36.3	7.20	8.74	7.27	9.86
Baltimore, Md	Jan. 1, 1871	53.3	75.9	57.1	36.3	10.14	12.54	9.93	9.64
Washington City	Nov. 1, 1870	53.0	7[illegible].4	56.6	35.0	10.25	13.42	9.90	9.52
Cape Henry, Va	Dec. 15, 1873	55.0	75.8	62.3	42.3	14.87	15.06	13.27	13.09
Chincoteague, Va	Mar. 16, 1880	50.3	72.3	63.2	37.2	8.81	10.83	8.51	12.92
Lynchburg, Va	May 24, 1871	56.1	76.3	57.7	38.8	10.48	10.67	9.66	11.40
Norfolk, Va	Jan. 1, 1871	57.0	77.3	60.7	42.2	12.18	15.70	11.95	11.78
South Atlantic States:									
Charlotte, N. C	Oct. 6, 1878	59.6	77.1	61.5	43.8	13.30	14.65	10.52	16.00
Hatteras, N. C	Dec. 1, 1880	57.1	76.6	66.4	46.4	17.51	17.61	20.32	18.17
Kitty Hawk, N. C	Jan. 15, 1875	55.4	76.1	63.3	43.8	14.99	19.82	15.72	15.12
Macon, Fort, N. C	May 23, 1878	58.8	77.2	66.0	47.3	13.81	18.30	13.59	13.40
Smithville, N. C	Oct. 15, 1875	61.6	79.0	65.2	48.4	10.35	15.16	14.74	10.50
Wilmington, N. C	Jan. 1, 1871	62.0	78.5	64.0	48.2	11.95	20.50	14.29	11.05
Charleston, S. C	Jan. 5, 1871	65.0	81.0	66.8	51.2	13.90	19.99	14.80	11.23
Augusta, Ga	Nov. 2, 1870	64.2	80.2	64.5	48.8	13.40	13.42	10.21	12.40
Savannah, Ga	Jan. 1, 1871	66.6	81.1	66.9	52.9	11.78	19.45	11.47	10.00
Jacksonville, Fla	Sept. 11, 1871	69.1	81.4	69.9	56.8	10.47	17.79	16.70	9.74
Florida Peninsula:									
Cedar Keys, Fla	Nov. 7, 1879	70.3	81.7	72.4	60.1	8.86	24.10	11.72	11.18
Key West, Fla	Nov. 1, 1870	76.9	83.8	78.8	70.8	6.10	13.47	14.80	5.94
Sanford, Fla	Sept. 1, 1882	71.6	80.5	73.3	61.6	8.41	22.35	10.23	4.73
Eastern Gulf States:									
Atlanta, Ga	Sept. 25, 1878	61.3	76.5	62.4	46.1	15.70	11.36	9.86	19.16
Pensacola, Fla	Oct. 27, 1879	67.9	80.3	69.5	56.0	14.34	22.53	15.52	14.92
Mobile, Ala	Nov. 7, 1870	67.2	81.2	67.7	52.6	18.86	19.18	13.19	14.26
Montgomery, Ala	Nov. 9, 1870	65.3	80.6	65.5	50.4	16.94	11.79	8.92	15.50
Vicksburg, Miss	Sept. 10, 1871	66.0	80.8	65.5	50.4	19.55	11.37	13.45	16.69
New Orleans, La	Nov. 1, 1870	69.0	81.9	69.9	56.0	17.80	18.44	13.28	14.77
Western Gulf States:									
Shreveport, La	Sept. 3, 1871	66.1	81.9	65.2	48.9	16.26	9.17	12.82	15.37
Fort Smith, Ark	June 1, 1882	59.4	77.7	62.8	37.7	9.90	9.01	12.98	13.91
Little Rock, Ark	July 1, 1879	62.3	78.8	63.1	45.3	18.38	10.82	11.50	18.57
Galveston, Tex	Apr. 19, 1871	69.9	83.5	71.4	55.5	10.83	13.21	17.20	11.77
Indianola, Tex	May 1, 1872	70.4	82.8	71.5	55.6	7.54	9.28	13.79	7.01
Palestine, Tex	Dec. 3, 1881	65.5	79.9	67.1	48.6	17.75	7.98	14.26	10.12

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, &c.—Continued.

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Rio Grande Valley:		°	°	°	°	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Brownsville, Tex	Aug. 25, 1875	74.3	83.5	73.6	60.4	4.89	9.08	13.07	5.89
Rio Grande City, Tex	May 28, 1875	76.0	85.2	73.3	60.3	4.75	7.37	6.37	3.49
Ohio Valley and Tennessee:									
Chattanooga, Tenn	Jan. 8, 1879	60.1	76.2	61.3	44.2	16.39	12.18	11.65	19.63
Knoxville, Tenn	Jan. 1, 1871	57.2	74.8	57.7	39.7	14.96	13.31	10.03	15.58
Memphis, Tenn	Feb. 28, 1871	61.3	79.5	60.9	42.7	17.66	11.31	11.23	15.77
Nashville, Tenn	Nov. 1, 1870	59.7	78.5	59.7	41.2	14.65	12.62	10.25	14.58
Louisville, Ky	Sept. 11, 1871	55.7	76.7	57.6	37.2	12.87	12.44	9.78	13.44
Indianapolis, Ind	Feb. 10, 1871	52.3	74.4	54.1	31.9	11.89	14.35	9.72	10.06
Cincinnati, Ohio	Nov. 1, 1870	54.6	76.1	56.9	36.2	10.73	12.91	8.59	11.51
Columbus, Ohio	July 1, 1878	50.9	73.0	54.7	31.9	11.11	11.10	9.33	11.00
Pittsburg, Pa	Nov. 1, 1870	50.1	72.3	53.3	32.3	8.32	11.54	7.64	8.57
Lower Lakes:									
Buffalo, N. Y	Nov. 1, 1870	41.9	67.9	50.2	26.4	8.33	9.73	10.32	8.60
Oswego, N. Y	Nov. 1, 1870	43.1	68.1	50.9	27.4	8.02	9.06	9.21	9.40
Rochester, N. Y	Nov. 1, 1870	43.3	68.6	49.7	25.7	9.15	9.74	8.38	9.10
Erie, Pa	May 25, 1873	45.0	70.0	52.7	29.7	9.26	10.44	13.02	10.25
Cleveland, Ohio	Nov. 1, 1870	45.8	69.9	52.0	28.2	8.71	11.82	9.51	8.00
Sandusky, Ohio	Aug. 2, 1877	48.0	71.0	54.0	30.6	8.93	13.00	10.05	8.43
Toledo, Ohio	Nov. 1, 1870	47.5	71.8	52.3	29.3	7.73	10.36	8.05	6.60
Detroit, Mich	Nov. 1, 1870	45.2	69.7	50.8	26.9	8.76	10.75	7.98	7.41
Upper Lakes:									
Alpena, Mich	Sept. 10, 1872	36.4	63.1	44.8	20.2	7.79	11.03	12.22	6.60
Escanaba, Mich	May 24, 1871	35.8	64.0	44.2	17.2	7.48	12.34	10.99	4.40
Grand Haven, Mich	May 24, 1871	43.4	67.5	49.6	26.9	8.93	10.82	11.24	7.02
Mackinaw City, Mich	Aug. 20, 1882	34.3	61.0	47.3	18.1	5.28	8.98	8.61	15.86
Marquette, Mich	May 1, 1871	36.9	63.1	44.6	19.3	6.02	10.62	11.39	4.65
Port Huron, Mich	July 25, 1874	41.2	66.4	49.0	24.2	9.21	9.60	8.38	6.74
Chicago, Ill	Nov. 1, 1870	46.0	69.8	51.7	27.6	10.42	10.87	9.50	6.56
Milwaukee, Wis	Nov. 1, 1870	42.0	66.9	48.2	23.1	9.48	10.25	8.05	5.76
Duluth, Minn	Nov. 1, 1870	37.1	63.5	43.5	14.9	7.84	13.03	9.47	3.54
Upper Mississippi Valley:									
Saint Paul, Minn	Nov. 1, 1870	43.9	69.5	45.7	17.0	7.31	11.98	6.95	3.44
La Crosse, Wis	Oct. 15, 1872	46.2	71.1	48.4	20.4	7.27	13.40	9.89	3.03
Davenport, Iowa	May 24, 1871	48.6	72.9	51.5	25.6	9.89	12.52	8.51	4.93
Des Moines, Iowa	Aug. 1, 1878	48.5	72.0	51.4	23.1	10.35	16.10	10.50	4.29
Dubuque, Iowa	July 10, 1873	47.4	71.6	49.8	23.2	9.36	14.45	10.42	4.82
Keokuk, Iowa	July 16, 1871	50.0	75.1	53.3	28.0	9.67	13.06	9.29	5.60
Cairo, Ill	June 1, 1871	57.9	77.6	58.5	38.2	12.79	11.57	9.90	12.53
Springfield, Ill	July 1, 1879	52.3	73.9	55.2	31.2	12.47	12.15	11.08	10.97
Saint Louis, Mo	Nov. 1, 1870	54.7	76.7	56.3	34.1	10.23	11.52	8.24	7.74
Missouri Valley:									
Leavenworth, Kans	May 21, 1871	53.0	76.0	54.3	29.6	11.19	14.13	9.11	4.62
Omaha, Nebr	Nov. 1, 1870	49.8	74.1	50.8	24.2	9.95	16.21	8.06	2.41
Bennett, Fort, Dak	Dec. 22, 1879	42.6	70.3	45.2	15.0	6.13	7.18	2.28	2.07
Huron, Dak	July 1, 1881	41.4	67.7	45.1	14.0	7.88	12.08	4.29	0.94
Yankton, Dak	April 1, 1873	44.8	71.4	47.5	18.7	8.88	11.84	4.88	2.22
Extreme Northwest:									
Moorhead, Minn	Jan. 1, 1881	36.0	65.8	40.5	4.2	5.92	12.93	7.28	3.12
Saint Vincent, Minn	Sept. 5, 1880	32.5	63.0	37.1	−0.8	3.91	8.78	5.32	1.37
Bismarck, Dak	Sept. 15, 1874	38.8	66.9	41.4	10.2	7.24	8.81	3.45	2.05
Buford, Fort, Dak	Oct. 23, 1878	38.9	65.8	40.3	8.0	3.93	6.31	2.18	2.22
Northern Slope:									
Assinaboine, Fort, Mont	Oct. 6, 1879	40.8	65.1	40.7	13.6	3.15	7.85	3.27	2.60
Benton, Fort, Mont	Oct. 11, 1879	42.5	67.3	42.6	17.5	4.47	4.70	2.73	1.96
Custer, Fort, Mont	Dec. 5, 1878	43.4	68.2	44.9	18.6	4.91	4.88	2.24	2.89
Helena, Mont	Oct. 15, 1879	42.1	65.0	42.6	18.4	2.78	4.53	3.76	4.42
Maginnis, Fort, Mont	July 14, 1882	38.0	61.5	41.3	17.0	2.75	2.31	2.89	2.77
Poplar River, Mont	May 1, 1882	40.8	66.2	40.2	−1.4	3.01	3.17	2.30	1.08
Shaw, Fort, Mont	Apr. 1, 1880	40.6	62.1	41.2	19.5	2.94	4.64	3.51	2.57
Deadwood, Dak	Dec. 25, 1877	40.1	66.6	42.9	22.5	12.27	8.56	3.41	3.42
Cheyenne, Wyo	Nov. 1, 1870	41.1	64.5	44.3	26.6	3.95	4.00	1.90	0.62
North Platte, Nebr	Sept. 18, 1874	47.0	71.3	48.6	24.0	5.57	8.97	3.05	1.74
Middle Slope:									
Denver, Colo	Nov. 19, 1871	47.4	69.8	49.6	29.9	5.87	4.94	2.34	1.83
Pike's Peak, Colo	Nov. 1, 1873	14.0	37.1	21.4	4.1	9.31	10.52	5.36	4.15
West Las Animas, Colo	Oct. 1, 1881	48.8	72.0	51.6	25.2	5.14	5.58	1.11	1.38
Dodge City, Kans	Sept. 15, 1874	52.6	75.1	53.7	30.2	6.41	9.91	3.07	1.53
Elliott, Fort, Tex	Nov. 20, 1879	54.8	74.4	55.4	33.7	6.68	9.15	6.52	1.46
Southern Slope:									
Sill, Fort, Ind. T	June 23, 1875	61.5	79.6	61.0	38.9	8.82	10.57	7.32	5.25
Concho, Fort, Tex	Oct. 10, 1875	65.1	80.7	63.2	45.6	7.73	9.89	8.66	3.83
Davis, Fort, Tex	Dec. 24, 1877	61.3	74.0	59.3	45.5	2.41	11.68	5.04	1.20

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APPENDIX 27.

Normal precipitation and departure (of 1884) *therefrom at stations of the Signal Service, commencement of observations*

Stations.	Established.	January.		February.		March.		April.		May.	
		Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
New England:		*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*
Eastport, Me	Apr. 1, 1873	3.26	+1.11	4.24	+5.12	5.29	—1.55	3.67	+3.16	4.52	+2.27
Portland, Me	Jan. 15, 1871	3.32	+1.22	3.22	+3.70	3.25	+1.61	3.04	+3.38	3.25	+3.21
Mount Washington, N. H	Dec. 1, 1870	4.14	—1.69	4.15	+3.40	6.75	—2.59	5.89	—2.60	6.85	+2.69
Boston, Mass	Nov. 1, 1870	4.19	+2.08	3.68	+2.06	4.96	—0.10	4.06	+0.70	3.47	—0.16
Thatcher's Island, Mass	Dec. 26, 1875	4.30	+3.36	4.04	+3.50	5.64	—0.94	4.27	—1.06	3.50	+0.89
Block Island, R. I	Sept. 1, 1880	5.28	+1.15	6.47	+0.84	4.84	+1.56	3.58	+0.52	5.08	+1.31
New Haven, Conn	Dec. 10, 1872	4.24	+0.39	4.34	+1.23	5.20	—1.05	4.16	—1.80	3.68	—0.96
New London, Conn	Jan. 10, 1871	4.12	+2.00	3.63	+1.99	5.06	+0.47	3.91	+0.08	3.46	+2.18
Middle Atlantic States:											
Albany, N. Y	Dec. 22, 1873	2.74	+0.24	2.84	+1.01	2.94	+1.06	2.80	—0.71	2.96	—0.17
New York City	Nov. 1, 1870	3.68	+2.39	3.36	+1.73	4.09	+0.34	3.21	—0.55	2.86	+1.49
Philadelphia, Pa	Jan. 1, 1871	3.41	+2.05	3.20	+2.50	3.38	+1.32	3.04	—1.41	2.83	+0.56
Atlantic City, N. J	Dec. 10, 1873	3.98	+3.19	3.46	+3.96	4.18	+1.66	3.66	+0.63	2.28	—0.66
Barnegat City, N. J	Dec. 10, 1873	4.99	+0.26	3.71	—2.60	5.06	—2.68	3.81	—2.84	2.64	—1.85
Cape May, N. J	May 24, 1871	4.32	+1.24	3.80	+2.42	5.18	+0.43	3.26	—0.92	2.51	—1.32
Sandy Hook, N. J	Dec. 10, 1873	4.30	+2.46	3.51	+1.21	5.39	—1.07	4.55	—1.40	4.09	—1.18
Delaware Breakwater, Del	Jan. 28, 1880	4.07	+0.12	3.23	+2.91	4.07	+2.64	1.78	+0.04	1.35	—0.47
Baltimore, Md	Jan. 1, 1871	3.18	+1.63	3.29	+3.40	4.11	+2.26	3.19	—0.54	2.84	+0.33
Washington City	Nov. 1, 1870	3.34	+2.25	3.14	+3.70	4.27	+2.97	2.99	—1.13	2.99	+0.10
Cape Henry, Va	Dec. 15, 1873	5.11	+3.32	3.59	—0.28	6.19	+1.46	5.49	—2.60	3.19	—2.41
Chincoteague, Va	Mar. 16, 1880	4.62	+0.27	4.23	+1.61	4.45	+3.36	2.39	—0.88	1.97	—0.85
Lynchburg, Va	May 24, 1871	4.05	+4.43	3.44	+5.58	4.05	+4.09	3.55	—1.20	2.88	—0.14
Norfolk, Va	Jan. 1, 1871	4.04	+1.90	3.90	+0.68	4.09	+4.44	4.12	—2.17	3.37	—2.12
South Atlantic States:											
Charlotte, N. C	Oct. 6, 1878	6.10	—1.50	4.65	+1.78	5.66	+3.53	4.84	+0.56	2.80	+2.04
Hatteras, N. C	Dec. 1, 1880	6.50	+1.14	5.25	—0.07	7.84	—2.00	5.78	—2.27	3.89	—1.29
Kitty Hawk, N. C	Jan. 15, 1875	6.13	+0.37	3.75	+0.57	6.31	+2.86	5.76	—0.93	2.92	—1.17
Macon, Fort, N. C	May 23, 1878	5.98	—0.25	3.10	—0.76	6.08	—1.98	4.25	—1.78	3.48	—0.10
Smithville, N. C	Oct. 15, 1875	4.00	—0.56	3.08	—0.20	4.16	—1.36	3.48	—1.11	2.71	—1.29
Wilmington, N. C	Jan. 1, 1871	3.95	+1.27	3.45	+0.35	4.46	+1.61	3.36	—0.91	4.13	—0.43
Charleston, S. C	Jan. 5, 1871	3.92	+1.97	3.69	+0.00	4.46	—0.07	4.92	—1.47	4.52	—2.34
Augusta, Ga	Nov. 2, 1870	4.48	—0.14	3.98	±0.00	5.74	+1.23	4.52	—0.84	3.14	+0.07
Savannah, Ga	Jan. 1, 1871	3.44	+0.45	3.14	+0.30	4.12	+0.79	4.78	—1.00	2.88	—1.66
Jacksonville, Fla	Sept. 11, 1871	3.39	+1.39	3.37	—0.92	3.09	—0.46	3.46	—1.14	3.92	+1.58
Florida Peninsula:											
Cedar Keys, Fla	Nov. 7, 1879	5.26	—0.18	2.70	—1.14	3.31	—1.10	2.98	+0.60	2.57	—0.61
Key West, Fla	Nov. 1, 1870	2.28	—0.46	1.83	—0.13	0.68	—0.47	1.39	—0.41	4.08	—3.73
Sanford, Fla	Sept. 1, 1882	1.20	—0.29	2.20	+2.20	1.22	—0.28	5.17	—3.27	2.02	—0.40
Eastern Gulf States:											
Atlanta, Ga	Sept. 25, 1878	7.15	—1.95	5.99	—0.15	7.16	+2.54	5.82	+0.04	2.72	—1.39
Pensacola, Fla	Oct. 27, 1879	5.08	—1.39	4.48	—1.05	4.37	+1.38	5.00	+0.67	4.97	+1.67
Mobile, Ala	Nov. 7, 1870	4.94	+2.46	4.58	+0.48	7.88	+3.65	6.02	—0.48	4.96	+3.52
Montgomery, Ala	Nov. 9, 1870	4.58	+0.24	5.51	—0.71	6.77	+2.78	6.46	—3.88	3.71	—2.53
Vicksburg, Miss	Sept. 10, 1871	5.50	+2.70	5.32	+1.41	6.94	+1.35	6.92	—2.45	5.69	+6.07
New Orleans, La	Nov. 1, 1870	5.44	—1.09	4.27	—1.11	5.93	+2.31	6.35	+0.13	5.52	—1.19
Western Gulf States:											
Shreveport, La	Sept. 3, 1871	4.75	—0.20	5.20	+0.29	5.02	—0.24	6.01	+0.59	5.23	+9.24
Fort Smith, Ark	June 1, 1882	2.03	—0.68	3.17	+2.55	1.74	+0.54	3.48	—0.86	4.68	—0.96
Little Rock, Ark	July 1, 1879	4.75	—1.30	3.66	+1.18	5.03	—0.36	6.28	+3.96	7.07	+0.26
Galveston, Tex	Apr. 19, 1871	3.89	+1.22	2.92	—2.03	3.14	+1.70	3.24	+2.31	4.45	+3.97
Indianola, Tex	May 1, 1872	1.96	—1.25	1.83	—1.79	2.60	—0.69	1.58	+0.88	3.36	+4.58
Palestine, Tex	Dec. 3, 1881	3.05	—0.74	3.39	—0.92	3.78	—0.16	4.75	+2.55	9.22	+8.03
Rio Grande Valley:											
Brownsville, Tex	Aug. 25, 1875	1.99	—0.80	1.69	—1.69	1.22	—1.15	0.65	—0.08	3.02	+2.84
Rio Grande City, Tex	May 28, 1875	1.05	—0.58	1.06	—1.06	1.12	—0.96	0.88	+0.05	2.75	+2.40
Ohio Valley and Tennessee:											
Chattanooga, Tenn	Jan. 8, 1879	7.93	—2.05	5.70	+3.11	7.00	+3.19	5.84	+0.11	3.55	—1.33
Knoxville, Tenn	Jan. 1, 1871	5.94	+0.72	5.16	+3.35	5.93	+6.00	5.78	—1.34	3.25	—1.06
Memphis, Tenn	Feb. 28, 1871	5.90	—0.24	5.80	+3.84	6.17	—1.09	6.63	+1.97	4.86	+1.60
Nashville, Tenn	Nov. 1, 1870	5.16	+2.04	5.58	+2.60	5.46	+3.43	5.66	—2.15	3.53	+0.05
Louisville, Ky	Sept. 11, 1871	4.06	—2.12	4.86	+4.98	4.37	—0.61	4.57	—1.06	3.98	+1.82
Indianapolis, Ind	Feb. 10, 1871	2.79	—1.74	3.77	+0.96	4.14	—1.13	3.45	—0.56	4.30	+0.50
Cincinnati, Ohio	Nov. 1, 1870	3.45	—1.24	4.08	+4.79	3.86	—1.23	3.22	—0.20	3.65	+1.91

APPENDIX 27.

United States Army, for each month of the year. (The normal has been computed from the to December, 1884, *inclusive.)*

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.
Inch.	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*
4.10	−1.92	5.12	+ 3.36	3.26	+1.15	3.64	−1.75	4.56	−2.68	4.72	+1.28	3.84	+ 4.79
3.48	−2.07	3.70	+ 3.08	3.38	+0.60	2.97	−2.41	3.56	−1.85	3.74	−1.49	3.14	+ 3.28
9.45	−1.37	10.90	+13.00	7.63	+1.00	8.90	−1.38	7.35	+5.56	6.62	+1.37	5.40	− 0.70
3.65	+0.36	3.93	+ 0.32	4.37	+0.64	3.07	−2.76	4.18	−1.01	5.06	−2.03	3.63	+ 0.83
2.85	−0.06	4.15	− 1.22	3.39	+1.91	2.56	−1.79	3.79	−0.93	6.36	−3.69	4.15	+ 1.67
4.98	−2.39	3.82	+ 2.70	3.48	+2.93	3.40	−2.78	5.01	−1.12	4.37	+1.56	4.61	+ 1.95
3.36	+1.90	4.94	+ 0.95	5.62	−0.02	3.92	−2.51	3.74	− 1.25	4.00	−1.76	3.61	+ 2.80
3.57	+2.72	4.54	+ 1.48	5.19	+1.94	3.38	−2.06	4.17	−1.64	4.12	−1.34	3.52	+ 3.84
4.08	−2.28	4.53	+ 0.51	3.35	+1.92	3.48	−1.68	3.08	−0.44	2.57	+0.87	2.75	+ 0.45
3.38	+0.78	4.58	+ 1.56	4.90	+3.66	3.61	−3.49	3.16	+0.47	3.35	+0.09	3.21	+ 3.45
3.58	−0.58	4.37	− 0.54	4.99	−0.69	3.47	−3.27	2.86	−1.82	3.20	−0.89	2.60	+ 0.68
3.34	+0.26	3.15	+ 1.58	5.12	−1.08	3.50	−3.16	2.81	+0.18	3.44	+0.59	4.86	+ 3.35
3.77	−1.53	4.04	− 0.81	4.87	+0.17	5.05	−4.00	3.46	−1.27	4.23	−1.55	4.57	+ 2.52
3.61	−2.58	3.38	+ 1.06	5.73	−0.43	4.16	−3.85	3.37	−2.04	3.63	−1.33	4.34	+ 2.53
4.36	−0.16	4.38	+ 2.04	4.71	+0.41	4.70	−4.67	3.41	+0.80	4.07	−0.50	3.88	+ 1.76
2.37	−1.00	2.68	− 0.56	3.69	+0.50	2.31	−1.32	2.68	−1.56	2.28	+0.14	2.56	+ 0.66
3.84	−1.33	4.44	+ 4.99	4.26	−2.52	4.08	−3.94	2.86	−1.44	3.04	+0.05	3.17	+ 0.74
4.42	+2.53	4.32	+ 3.07	4.68	−3.67	4.11	−3.97	2.91	−1.18	2.88	+0.54	3.04	+ 1.66
3.76	−1.24	6.17	+ 1.47	5.13	−2.57	5.23	−4.81	3.93	−3.19	4.11	−3.53	4.39	− 0.90
2.47	+1.13	4.01	+ 1.91	4.35	−3.25	2.50	−2.17	3.12	−2.00	2.89	−0.77	4.07	+ 1.68
3.46	+0.70	3.06	− 0.74	4.15	−1.80	3.46	−2.22	2.85	−2.81	3.35	+0.28	3.91	+ 7.90
4.31	+2.14	5.51	+ 1.55	5.88	−2.93	4.87	−4.70	3.71	−3.24	3.37	−2.68	3.84	+ 0.52
4.21	+5.26	5.77	+ 2.13	4.67	−2.59	3.23	+0.34	3.23	−1.72	4.06	+0.67	5.25	+ 0.47
4.73	−2.22	6.64	+ 3.87	6.24	−0.35	7.35	−6.34	6.69	−5.46	6.28	+6.74	6.42	+ 0.99
4.73	−0.16	7.19	+ 3.57	7.90	−1.32	6.08	−5.93	4.38	−3.15	5.26	+1.88	5.24	+ 0.41
5.44	−3.81	6.69	− 2.33	6.17	+0.69	7.48	−1.92	3.31	−2.97	2.80	+0.26	4.38	+ 1.02
3.38	−1.07	6.27	+ 1.05	5.51	−0.13	6.46	−3.85	5.26	−5.03	3.02	−1.21	3.51	− 0.58
6.07	+1.87	6.38	+ 1.91	8.05	+1.53	7.78	+1.56	3.76	−3.18	2.75	−0.79	3.65	+ 0.07
5.28	+2.97	7.35	+ 2.17	7.86	−1.24	6.77	+4.26	4.67	−4.82	3.36	−1.87	3.62	− 0.36
4.15	+0.19	4.43	− 1.18	4.84	−0.48	3.98	+0.26	2.18	−1.80	4.10	−2.39	3.94	+ 0.25
6.92	+2.45	4.86	− 1.18	7.67	+0.74	5.24	−0.69	3.69	−1.40	2.64	−0.82	3.42	− 0.21
5.50	+1.89	5.25	+ 0.77	7.04	−1.83	7.15	−1.47	6.43	−2.81	3.12	+2.31	2.98	+ 1.06
6.15	+0.53	8.48	− 2.46	9.47	−1.86	5.52	−1.89	3.35	−3.22	2.85	+0.21	3.22	+ 2.44
4.09	+0.47	4.13	− 1.77	5.25	−2.09	6.60	+0.48	5.68	−2.51	2.52	+3.51	1.83	− 0.15
9.07	+0.50	4.86	+ 1.21	8.92	+2.17	3.63	+0.20	5.70	−2.68	0.90	+0.55	1.88	+ 1.18
4.25	+6.48	3.26	− 0.84	3.85	−1.79	2.73	−2.65	2.46	−1.76	4.67	−1.83	6.02	+ 0.07
5.63	+2.21	6.42	+ 2.37	10.48	−8.41	6.78	−1.90	4.28	−1.85	4.51	+0.65	5.86	+ 0.24
5.62	+1.39	6.48	− 1.52	7.08	−5.82	5.03	−3.25	3.84	+1.52	4.82	−0.20	4.74	+ 0.36
4.78	+5.48	3.65	− 0.85	3.36	−0.81	2.77	−2.19	2.59	−0.72	3.56	−0.89	5.41	− 1.41
3.80	−0.06	4.14	− 1.61	3.48	−1.27	4.14	+0.98	3.52	−2.44	5.79	−3.31	5.87	+ 7.65
6.22	+2.38	6.60	− 2.48	5.62	−4.75	4.30	−1.18	3.57	+2.03	5.41	−2.28	5.06	+ 2.95
3.22	+1.00	2.94	− 3.38	2.01	−0.02	4.21	−2.11	3.68	+3.14	4.93	+0.80	5.42	+10.18
2.88	−0.47	4.00	+ 1.98	2.13	+1.60	4.39	+0.64	4.54	−3.22	4.05	+1.14	3.71	+ 2.59
3.28	−1.10	3.69	+ 0.54	3.85	−0.59	3.16	+1.84	3.44	−2.14	4.90	−2.07	5.17	+11.75
4.26	+2.58	3.60	− 2.44	5.85	−3.58	6.25	+0.79	5.75	+1.62	5.20	−0.95	4.96	+ 4.48
2.74	+4.82	2.41	− 2.08	4.13	−2.85	6.75	+2.85	3.94	+4.00	3.10	−0.25	3.22	− 1.17
3.27	−0.62	2.62	− 2.56	2.09	−1.48	2.75	+1.25	5.29	−3.84	6.22	−3.29	3.68	+ 3.26
1.85	+0.89	2.36	−2.13	4.87	−3.99	5.85	+3.11	4.69	+11.02	2.53	+0.98	2.21	− 0.88
1.35	−1.83	1.58	−1.58	4.44	−4.44	3.06	+4.24	2.45	+ 2.00	0.86	−0.83	1.38	− 1.05
4.29	+4.91	3.63	+1.16	4.26	−1.72	3.74	−1.74	3.27	− 1.44	4.64	−2.89	6.00	+ 0.80
4.46	+0.87	4.59	+4.00	4.26	+0.49	2.92	−2.26	2.94	− 0.89	4.17	−2.86	4.48	+ 1.63
5.32	+1.94	2.84	−0.46	3.15	−1.88	2.96	+1.33	3.75	− 0.92	4.52	−2.44	4.07	+ 5.07
4.29	−2.33	5.00	−1.82	3.42	−0.61	3.34	−0.98	3.02	− 0.59	3.89	−2.82	3.84	− 0.06
4.49	−0.99	4.39	−0.45	3.56	+1.25	2.79	+3.11	3.40	− 1.40	3.59	−1.73	4.52	+ 0.59
5.45	−1.34	5.80	+0.23	3.10	−2.64	2.62	+0.47	3.38	− 1.07	3.72	−2.26	3.52	+ 2.53
4.79	−2.02	4.10	−2.37	4.02	−1.97	2.29	+1.58	2.98	− 1.63	3.82	−2.09	3.98	+ 0.01

Normal precipitation and departure (of 1884)

Stations.	Established.	January.		February.		March.		April.		May.	
		Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
Ohio Valley and Tennessee—Continued:		*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*
Columbus, Ohio	July 1, 1878	3.09	—0.84	4.11	+0.84	3.62	—0.03	2.98	—0.87	4.51	—0.72
Pittsburg, Pa	Nov. 1, 1870	3.02	+1.80	2.54	+2.03	3.09	+0.62	2.48	—1.37	2.75	+0.73
Lower Lakes:											
Buffalo, N. Y	Nov. 1, 1870	2.66	+0.70	2.54	+1.49	2.98	—0.14	2.36	—0.80	2.99	+0.93
Oswego, N. Y	Nov. 1, 1870	3.16	+3.33	2.58	+0.40	3.24	+0.57	2.00	—1.12	2.78	—0.39
Rochester, N. Y	Nov. 1, 1870	3.44	+1.60	2.62	—0.68	3.40	—0.10	2.52	—1.58	3.23	—0.95
Erie, N. Y	May 25, 1873	3.44	+1.15	3.37	+2.51	3.19	+0.65	2.52	—0.53	3.55	—0.13
Cleveland, Ohio	Nov. 1, 1870	2.43	—0.88	2.81	+2.46	3.07	—1.20	2.44	—0.69	3.20	+0.40
Sandusky, Ohio	Aug. 2, 1877	2.05	—0.80	3.47	+2.01	2.95	+0.31	2.58	—1.08	3.40	+0.30
Toledo, Ohio	Nov. 1, 1870	2.09	+0.52	2.02	+1.01	2.26	—0.17	2.27	—0.70	3.20	+1.51
Detroit, Mich	Nov. 1, 1870	2.13	—0.05	2.48	+0.91	2.82	—0.72	2.31	—0.77	3.63	—1.25
Upper Lakes:											
Alpena, Mich	Sept. 10, 1872	2.12	+0.95	2.15	+0.63	2.03	—0.42	1.82	—1.07	3.94	—0.67
Escanaba, Mich	May 24, 1871	1.28	—0.73	1.40	+1.35	1.71	—0.61	1.84	+0.76	3.93	—1.24
Grand Haven, Mich	May 24, 1871	2.31	+0.52	2.14	+0.58	2.61	+1.25	2.72	+1.11	3.60	—0.01
Mackinaw City, Mich	Aug. 20, 1882	6.63	+1.46	4.04	+1.06	1.30	—0.15	0.84	+0.15	3.08	—1.41
Marquette, Mich	May 1, 1871	1.15	—0.24	1.40	+0.65	1.34	—0.60	1.70	+2.24	2.98	—0.55
Port Huron, Mich	July 25, 1874	1.92	—0.29	2.40	+0.76	3.86	+2.02	2.25	+0.33	3.10	—1.39
Chicago, Ill	Nov. 1, 1870	1.99	—0.60	2.35	+0.92	2.96	+2.20	3.60	—0.55	3.86	—2.33
Milwaukee, Wis	Nov. 1, 1870	1.96	—0.27	1.97	+0.64	2.82	—0.05	3.01	+0.14	3.65	—1.98
Duluth, Minn	Nov. 1, 1870	1.01	—0.34	1.15	+1.56	1.65	—0.33	2.16	+1.48	4.03	+1.14
Upper Mississippi Valley:											
Saint Paul, Minn	Nov. 1, 1870	1.03	—0.55	1.08	+0.19	1.62	—0.28	2.09	—0.09	3.60	—1.51
La Crosse, Wis	Oct. 15, 1872	1.17	—0.64	1.18	+0.24	1.80	—0.69	2.04	+1.03	3.43	—1.61
Davenport, Iowa	May 24, 1871	1.67	—0.92	1.57	—0.59	2.36	+0.91	3.07	—2.30	4.46	—0.67
Des Moines, Iowa	Aug. 1, 1878	1.02	—0.17	1.73	+0.19	1.54	+0.70	2.64	+0.33	6.17	—1.83
Dubuque, Iowa	July 10, 1873	1.43	—0.44	1.59	+0.60	2.44	+1.41	2.91	—0.14	4.01	+0.87
Keokuk, Iowa	July 16, 1871	1.60	—0.75	1.75	+0.13	2.38	+0.99	3.10	—1.79	4.19	—1.03
Cairo, Ill	June 1, 1871	4.24	—1.92	4.56	+1.02	4.19	+0.01	4.32	—0.67	4.28	+0.29
Springfield, Ill	July 1, 1879	1.90	—0.39	5.69	—1.45	3.36	+0.34	3.19	—0.70	5.92	—2.13
Saint Louis, Mo	Nov. 1, 1870	2.09	—1.30	3.20	+1.23	3.04	—0.04	3.41	+0.74	3.78	—1.10
Missouri Valley:											
Leavenworth, Kans	May 21, 1871	1.32	—0.35	1.58	—0.16	2.49	+1.21	3.65	+1.09	5.05	—0.26
Omaha, Nebr	Nov. 1, 1870	0.56	+0.17	0.85	+0.57	1.58	+3.33	3.35	+0.53	5.02	—3.57
Bennett, Fort, Dak	Dec. 22, 1879	0.88	—0.57	0.74	+0.17	1.23	—0.15	2.28	+0.07	2.62	+0.07
Huron, Dak	July 1, 1881	0.13	—0.04	0.43	+0.15	0.92	+0.61	3.01	—0.31	3.95	—1.05
Yankton, Dak	April 1, 1873	0.58	—0.33	0.88	+0.92	1.20	—0.28	3.10	+2.63	4.58	—3.15
Extreme Northwest:											
Moorhead, Minn	Jan. 1, 1881	0.92	—0.37	1.25	+0.07	1.22	—0.19	1.34	—0.11	3.36	—1.61
Saint Vincent, Minn	Sept. 5, 1880	0.34	—0.20	0.47	—0.23	0.56	—0.18	0.81	—0.01	2.54	—1.43
Bismarck, Dak	Sept. 15, 1874	0.56	—0.18	0.68	+0.19	1.15	—0.55	2.86	—0.66	3.23	—0.67
Buford, Fort, Dak	Oct. 23, 1878	0.74	—0.63	0.50	—0.38	0.52	—0.42	1.26	+0.04	2.15	—2.01
Northern Slope:											
Assinaboine, Fort, Mont	Oct. 6, 1879	1.28	—1.12	0.52	—0.08	0.77	—0.24	0.89	—0.64	1.49	+1.56
Benton, Fort, Mont	Oct. 11, 1879	0.80	—0.24	0.50	(1)	0.77	(1)	0.87	(1)	2.83	—1.74
Custer, Fort, Mont	Dec. 5, 1878	1.33	+1.52	0.50	+0.79	0.53	+0.49	1.17	—0.40	3.21	—2.02
Helena, Mont	Oct. 15, 1879	2.06	+1.69	0.74	+0.59	0.41	+0.18	1.26	—0.20	1.11	—0.48
Maginnis, Fort, Mont	July 14, 1882	1.38	+0.09	0.64	+0.05	1.01	—0.45	0.50	+0.12	1.24	—0.48
Poplar River, Mont	May 1, 1882	0.38	—0.07	0.42	—0.01	0.54	(1)	0.76	+0.15	1.71	—0.93
Shaw, Fort, Mont	April 1, 1880	1.17	—0.31	0.46	+0.36	0.56	—0.14	0.71	—0.12	1.67	—0.93
Deadwood, Dak	Dec. 25, 1877	0.92	—0.07	0.95	+0.06	1.78	+0.83	5.05	—2.76	5.44	—3.72
Cheyenne, Wyo	Nov. 1, 1870	0.27	+0.49	0.14	+0.12	0.56	+1.03	1.06	+0.27	2.33	+2.50
North Platte, Nebr	Sept. 18, 1874	0.60	+0.50	0.30	—0.16	0.64	+1.18	1.84	+0.30	3.09	—0.69
Middle Slope:											
Denver, Colo	Nov. 19, 1871	0.66	—0.44	0.46	+0.40	0.87	+0.06	1.83	+1.50	3.17	+1.44
Pike's Peak, Colo	Nov. 1, 1873	1.61	—1.51	1.28	—0.52	1.98	—1.59	3.32	—2.89	4.01	—1.11
West Las Animas, Colo	Oct. 1, 1881	0.20	+0.06	0.35	+0.15	0.48	+0.71	0.90	+0.06	3.67	+0.79
Dodge City, Kans	Sept. 15, 1874	0.26	—0.18	0.55	—0.27	0.82	+1.09	1.24	—0.17	4.35	+0.12
Elliott, Fort, Tex	Nov. 29, 1879	0.28	+0.33	0.35	—0.08	0.26	+0.08	0.80	+0.28	5.62	+0.67
Southern Slope:											
Concho, Fort, Tex	Oct. 10, 1875	1.12	+0.14	1.24	—0.76	1.24	—0.48	1.98	+3.66	4.51	+8.99
Davis, Fort, Tex	Dec. 24, 1877	0.62	—0.14	0.17	—0.17	0.27	+0.01	0.60	+1.03	1.54	—0.46
Stockton, Fort, Tex	Feb. 26, 1876	0.28	—0.07	0.83	+0.05	0.58	—0.46	0.42	+0.49	1.39	+0.27
Southern Plateau:											
El Paso, Tex	Nov. 5, 1877	0.70	—0.15	0.52	+0.32	0.55	—0.22	0.23	+0.68	0.32	—0.32
Apache, Fort, Ariz	Oct. 9, 1877	1.29	—0.61	2.00	+1.43	1.81	+2.63	0.82	+0.85	0.58	+0.73
Grant, Fort, Ariz	Nov. 1, 1875	0.78	+0.34	1.29	+3.33	1.42	+2.45	0.25	+0.22	0.43	+0.38
Phœnix, Ariz	Aug. 18, 1876	0.56	—0.40	0.99	+1.47	0.83	+1.31	0.37	+0.03	0.08	—0.07
Prescott, Ariz	Nov. 19, 1873	1.08	—0.83	1.45	+5.10	1.41	+4.10	0.92	+0.70	0.57	+0.88
San Carlos Agency, Ariz	June 1, 1881	1.28	—0.28	2.28	+1.55	1.74	+2.23	0.28	+0.56	0.52	—0.20
Thomas, Camp, Ariz	Sept. 22, 1877	0.51	—0.06	1.40	+1.54	1.61	+1.60	0.29	+0.43	0.39	+0.21
Verde, Fort, Ariz	Nov. 9, 1874	0.72	—0.33	0.99	+2.00	1.30	+2.24	0.89	+0.54	0.37	+0.35
Wickenburg, Ariz	Jan. 6, 1874	1.00	—0.81	1.20	+3.01	0.84	+2.83	0.52	+0.72	0.26	+0.38
Yuma, Ariz	Nov. 18, 1873	0.38	—0.38	0.64	+0.94	0.24	+1.24	0.09	—0.02	0.06	+0.38

[1] Record incomplete.

therefrom at stations of the Signal Service, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
Inch.	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches,*	*Inch.*	*Inches.*	*Inch.*	*Inches.*
3.81	—1.22	3.71	—1.55	3.58	—2.88	2.47	+0.99	3.52	— 1.86	3.34	—2.35	3.80	—1.03
3.57	—1.86	4.81	—0.77	3.16	—0.22	2.65	—1.48	2.55	— 0.53	2.44	—1.26	3.01	+1.06
3.15	—0.35	3.67	+1.44	2.91	+1.65	3.04	—1.27	3.80	— 2.26	3.48	—0.97	3.40	—0.33
3.34	—1.86	3.27	—1.37	2.45	—0.74	2.48	—0.56	3.47	— 0.26	3.26	—1.17	3.66	—1.05
3.25	+1.07	3.48	—0.45	3.01	—0.49	2.32	—0.42	3.25	— 1.38	2.81	—1.49	3.04	—0.42
3.95	—1.55	3.47	+1.82	3.02	—0.86	4.32	—0.40	4.24	— 1.01	4.46	+0.45	3.44	+0.40
4.25	—0.96	4.28	+0.85	3.20	—1.64	3.90	—0.14	3.05	— 1.08	2.56	—0.97	2.76	—0.93
4.62	—2.20	4.34	—1.41	4.04	—1.56	3.50	—0.83	3.21	— 2.03	3.34	—2.33	2.91	—0.47
3.70	—1.00	3.76	—0.10	2.90	—1.42	2.45	—1.43	2.74	— 0.60	2.86	—1.47	2.49	—0.46
3.80	—1.88	4.12	—0.36	2.83	—1.28	2.68	+0.02	2.80	— 0.84	2.50	—0.76	2.80	+0.25
4.04	—1.87	3.54	—1.16	3.45	—0.76	4.66	+0.17	4.68	— 0.93	2.88	—0.73	2.33	+3.25
4.79	—2.27	3.44	—0.43	4.11	+0.60	4.39	+4.38	3.98	+ 3.99	2.62	—0.48	1.72	+2.62
4.54	—0.72	3.41	+0.60	2.87	—0.57	3.02	+0.23	4.03	+ 2.07	3.29	—0.68	2.57	+4.23
2.93	—0.64	3.43	—0.92	2.62	+0.66	2.18	—0.22	3.20	+ 0.65	3.43	—0.54	5.21	+1.27
4.13	—2.92	3.35	—0.90	3.14	+2.32	5.23	—0.32	3.83	+ 2.09	2.33	+0.44	2.10	+6.55
3.88	—1.01	2.94	—0.90	2.78	—1.50	2.48	—0.61	3.23	— 1.63	2.67	—0.33	2.42	+0.59
4.28	—2.17	3.94	—0.23	2.65	—0.15	2.78	—0.49	3.84	— 0.25	2.88	—1.08	2.22	+1.99
4.07	+0.15	3.39	+0.41	2.79	—0.95	3.12	—0.30	2.80	— 0.62	2.13	—0.68	1.83	—0.54
5.37	+4.24	4.10	—0.65	3.56	+3.36	4.58	+0.12	3.14	+ 0.83	1.75	—0.80	1.38	—0.16
5.02	—1.45	3.20	—0.27	3.76	—0.87	3.35	+1.13	2.23	+ 0.20	1.37	—0.72	1.33	+0.65
4.73	—1.79	5.02	—0.44	3.65	+0.17	5.12	+4.89	2.78	+ 0.47	1.99	—0.54	1.28	+0.97
4.98	—1.92	3.93	+0.58	3.60	+0.24	3.29	+1.50	3.11	+ 4.06	2.11	—0.62	1.69	+1.99
3.39	—4.55	4.00	+3.16	3.71	+0.13	3.19	+2.27	4.72	+ 0.61	2.59	—1.33	1.54	+0.39
5.65	—0.76	5.30	±0.00	3.50	+0.75	4.89	—0.82	3.20	+ 0.96	2.33	—0.90	1.80	+2.28
5.51	—1.48	4.67	—2.37	2.88	—0.14	3.64	+0.61	3.56	— 0.21	2.09	—0.86	2.25	+1.66
4.52	—1.57	4.27	+3.07	2.78	—0.04	2.57	+2.45	3.31	— 1.42	4.02	—1.61	3.73	+5.26
6.95	—0.75	2.66	+0.96	2.54	—1.00	3.26	+3.60	4.32	— 1.58	3.50	—2.20	3.38	+1.81
4.80	—0.28	4.25	- 1.39	2.47	—1.26	2.80	+3.24	2.75	— 0.27	2.69	—0.39	2.45	+3.73
5.71	—2.38	5.12	+4.31	3.30	+1.35	3.26	+2.12	3.37	+ 0.04	2.48	—1.06	1.72	—0.24
6.73	—0.62	5.95	+4.40	3.53	+3.54	3.60	+1.31	3.10	+ 2.71	1.36	—1.04	1.00	—0.28
3.55	—0.45	2.33	+1.46	1.80	—0.56	1.19	—0.51	0.80	+ 0.16	0.29	—0.12	0.45	+0.01
4.46	—1.28	4.94	+0.17	2.68	—1.50	1.73	—0.47	2.24	— 0.72	0.32	—0.15	0.38	+0.24
5.11	—3.39	4.14	+0.49	2.59	+0.02	2.73	—2.45	1.80	+ 0.17	0.35	—0.33	0.76	+0.04
3.80	—1.96	4.70	+2.62	4.43	+1.74	2.74	—0.25	3.43	+ 0.27	1.11	—0.77	0.95	—0.19
2.62	+0.01	2.48	+0.99	3.68	+3.50	2.14	+1.30	2.73	— 1.58	0.45	—0.03	0.56	+0.29
3.64	—0.01	2.35	+1.27	2.82	+0.98	1.44	+0.90	1.30	— 0.38	0.71	+0.02	0.81	+0.90
2.68	+1.69	2.49	—0.62	1.14	—0.08	0.87	+0.34	0.95	— 0.51	0.36	—0.05	0.98	—0.58
2.18	+2.54	3.68	+5.99	1.99	+0.62	1.51	+1.18	0.65	— 0.24	1.11	—0.69	0.80	—0.08
1.85	+0.33	1.81	+1.28	1.04	—0.25	1.10	+0.34	0.84	— 0.48	0.79	—0.50	0.66	+0.35
2.51	+1.36	1.21	—0.41	1.16	+0.93	0.75	+0.67	0.99	— 0.33	0.50	—0.13	1.06	—0.79
2.24	+2.05	1.35	+1.90	0.94	—0.47	1.86	—0.56	1.22	— 0.73	0.68	—0.22	1.62	—0.06
1.08	+0.13	0.46	+0.18	0.77	+0.56	0.55	—0.29	1.73	— 1.40	0.61	—0.30	0.75	+0.07
0.95	+0.72	1.39	+2.01	0.83	—0.15	0.81	—0.17	1.16	— 0.70	0.33	+0.10	0.28	—0.06
2.23	—1.26	1.49	+1.17	0.92	—0.33	1.78	+0.51	1.04	— 0.65	0.60	+0.15	0.94	+1.53
4.10	—1.50	2.50	+1.01	1.96	+1.11	0.80	+1.19	1.54	— 0.06	1.07	+0.39	1.55	+0.24
1.42	+0.08	1.71	—1.11	1.47	+0.60	0.89	+0.36	0.75	— 0.25	0.26	—0.08	0.21	+0.46
3.72	—2.33	2.96	—0.77	2.29	—0.16	1.40	—1.32	1.33	— 0.59	0.32	—0.28	0.75	—0.48
1.59	—0.12	1.79	—1.14	1.56	+0.15	0.90	—0.77	0.74	— 0.53	0.70	—0.51	0.71	+0.05
1.83	—0.89	4.53	—4.12	4.16	—3.91	1.93	—1.44	1.49	— 0.50	1.94	—1.82	1.26	+0.24
2.64	+0.15	1.37	+0.88	1.57	+0.60	0.47	—0.41	0.46	— 0.03	0.18	+0.14	0.83	—0,11
3.06	+4.61	3.40	+3.00	3.45	+1.37	1.07	—0.84	1.34	+ 0.16	0.66	+0.17	0.72	+0.38
2.98	+3.93	3.04	—1.75	3.18	+2.42	2.54	—1.70	3.25	+ 2.29	0.73	+1.41	0.83	+2.22
2.44	—0.35	3.70	—1.33	3.75	—2.55	4.36	—0.76	2.99	+ 2.50	1.31	+0.64	1.47	+2.10
2.40	+0.38	3.73	—3.38	5.55	+1.15	2.16	+1.58	2.35	+ 2.00	0.53	+0.16	0.41	+0.07
2.06	+0.78	2.06	—1.54	2.76	—0.01	5.74	+0.10	1.62	+ 4.63	0.77	+0.05	0.70	+0.57
0.11	±0.00	3.29	—2.83	2.54	+1.44	1.36	+2.32	1.58	+ 3.57	0.50	—0.28	0.80	+1.27
1.02	+1.33	4.30	—4.16	5.00	+0.59	1.77	—0.27	1.88	+ 0.14	0.97	—0.15	2.26	+3.26
0.81	+0.39	3.68	—3.01	3.55	—1.14	1.28	—0.30	1.04	+ 2.02	0.54	—0.01	1.84	+4.09
0.13	+0.02	0.94	—0.87	1.12	+0.72	0.81	+0.69	0.27	+ 0.85	0.48	—0.24	1.29	+1.45
0.17	+0.15	2.13	—0.80	3.28	—1.71	1.25	+0.26	0.60	+ 0.82	0.50	—0.34	2.04	+3.54
0.40	+0.09	2.24	—1.87	3.58	—2.34	0.86	—0.03	0.89	+ 0.60	0.55	±0.00	2.28	+3.20
0.47	+0.05	1.63	—1.27	2.40	—0.36	0.66	+0.25	0.36	+ 0.33	0.34	+0.22	1.07	+3.49
0.31	—0.08	1.90	—1.71	3.30	—2.06	1.27	—0.59	0.56	+ 0.28	0.58	—0.43	1.93	+2.73
0.02	+0.04	0.88	—0.60	1.97	—0.95	0.75	—0.52	0.18	+ 0.15	0.42	—0.39	1.85	+3.42
0.01	—0.01	0.20	—0.19	0.26	+0.06	0.08	—0.08	0.04	— 0.04	0.03	—0.03	0.49	+1.47

Normal precipitation and departure (of 1884)

Stations.	Established.	January.		February.		March.		April.		May.	
		Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.	Normal.	Departure + or —.
Middle Plateau:		*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*	*In.*	*Inch.*
Salt Lake City, Utah	Mar. 19, 1874	1.88	—0.62	1.87	+0.86	2.01	+1.68	2.44	+0.45	2.14	—0.36
Northern Plateau:											
Boisé City, Idaho	July 1, 1877	2.43	—0.68	1.76	—0.44	1.49	+1.29	1.19	—0.41	1.02	—0.10
Cœur d'Alene, Fort, Idaho.	Sept. 1, 1881	3.86	+0.16	1.77	—0.48	0.76	+0.09	1.95	—0.59	1.78	—1.12
Lewiston, Idaho	July 1, 1879	2.89	—0.24	1.85	+1.25	1.18	+0.07	1.81	+0.14	1.00	—0.50
Dayton, Wash	July 1, 1879	3.92	—0.78	4.04	+1.62	1.99	—0.20	3.09	—0.69	1.77	—0.96
Spokane Falls, Wash	Feb. 5, 1881	2.82	—1.03	3.03	+0.02	1.10	+0.44	1.82	—0.49	1.18	—0.62
North Pacific Coast:											
Olympia, Wash	July 1, 1877	8.80	—3.83	9.74	—5.57	5.53	—3.96	4.24	—0.64	2.58	—1.12
Portland, Oreg	Nov. 1, 1871	7.06	—3.36	7.86	—2.98	6.88	—4.03	3.49	+0.08	2.35	—1.01
Roseburg, Oreg	July 15, 1877	6.47	—2.81	4.75	—1.04	3.95	—0.58	3.00	+0.48	1.77	—0.92
Middle Pacific Coast:											
Cape Mendocino, Cal	July 27, 1883	2.09	—0.82	2.40	+0.45	2.60	+0.92	3.18	+.023	1.00	—0.67
Red Bluff, Cal	July 1, 1877	6.08	-2.53	4.47	—2.26	3.55	+4.26	3.09	+1.22	1.20	—1.02
Sacramento, Cal	July 1, 1877	3.97	—0.54	3.83	+0.63	3.81	+4.33	3.78	+0.54	0.78	—0.72
San Francisco, Cal	Mar. 8, 1871	5.01	—1.07	4.16	+2.49	3.26	+4.98	2.12	+4.21	0.68	—0.45
South Pacific Coast:											
Los Angeles, Cal	July 1, 1877	2.21	+0.94	4.30	+9.07	3.44	+8.92	2.00	+1.58	0.57	—0.18
San Diego, Cal	Nov. 1, 1871	1.81	—0.47	2.61	+6.44	1.38	+4.85	0.84	+2.00	0.41	+1.76
Alaska Stations:											
Alexander, Fort, Alaska	Aug. 1, 1881	5.84	(3)	1.38	(3)	3.46	(3)	0.98	(3)	2.11	(3)
Atka, Alaska	Oct. —, 1882	9.04	—1.01	7.81	+3.00	6.38	+0.76	5.41	+0.56	5.90	+0.56
Pyramid Harbor, Alaska	Oct. —, 1881	4.45	—1.15	8.12	—3.22	4.01	+1.74	1.72	—0.74	1.78	+1.16
Saint Michael's, Ft., Alaska	June 26, 1874	0.96	—0.39	0.15	+0.02	0.37	+0.41	0.51	—0.25	0.91	—0.86
Sitka, Alaska	Mar. 30, 1881	10.97	+3.04	9.81	—3.66	10.19	+0.86	3.99	—1.23	5.01	+5.34
Unalashka, Alaska	Aug. 18, 1878	10.20	+1.73	8.34	17.85	6.44	+3.00	5.21	+8.79	5.44	—1.47
Behring's Island, Behring Sea	May 22, 1882	0.78	+0.16	2.24	—0.75	1.02	+0.42	1.20	+0.18	0.84	+0.47

[3] No record.

therefrom at stations of the Signal Service, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.	Normal.	Departure + or −.
Inch.	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inches.*	*Inch.*	*Inch.*
0.67	−0.34	0.59	−0.32	0.84	−0.11	0.85	+1.06	1.81	−1.45	1.47	−0.97	1.48	+0.64
0.94	+2.47	0.20	+0.40	0.09	−0.02	0.59	+1.52	1.63	−0.11	0.73	−0.61	2.35	+3.32
0.70	+0.98	0.56	+1.11	0.08	+0.09	0.94	+0.62	2.09	+0.73	2.38	−1.99	2.57	+0.65
1.88	+3.78	0.87	+0.48	0.30	−0.24	0.62	+0.39	1.96	+0.12	1.40	−1.04	3.28	−0.49
1.10	+0.92	0.70	−0.38	0.41	−0.32	0.82	+0.58	2.89	+0.65	2.00	−1.84	4.98	+0.12
1.40	−1.18	1.05	+0.01	0.32	+0.22	1.46	+0.97	2.63	−0.81	1.81	−1.22	2.37	+0.91
1.21	+1.99	0.88	−0.23	0.85	+0.11	2.09	+0.07	5.44	−1.14	7.31	−5.94	9.62	−3.80
1.79	−0.37	0.79	+1.01	0.77	−0.44	1.82	+2.43	4.88	−0.87	7.08	−3.84	8.22	−0.70
1.01	+0.89	0.47	−0.42	0.44	(1)	1.00	(1)	2.91	−1.76	3.40	−2.61	0.31	−2.89
0.47	+0.45	0.22	+0.28	0.11	+0.22	0.93	+0.25	1.74	−1.22	1.39	−0.99	2.42	+0.16
0.28	+0.69	0.01	−0.01	0.04	−0.04	0.42	−0.06	1.43	−0.53	2.20	−2.16	5.36	+2.37
0.31	+1.14	(2)	(2)	(2)	±0.00	0.33	+0.27	1.04	+0.07	1.17	−1.17	4.05	+6.40
0.33	+2.24	0.01	−0.01	0.01	+0.03	0.16	+0.17	1.23	+1.32	2.52	−2.26	4.93	+2.75
0.22	+1.17	(2)	+0.02	(2)	+0.02	(2)	±0.00	0.59	−0.20	0.96	+0.11	3.92	+0.73
0.07	+0.24	0.02	−0.02	0.21	−0.21	0.05	+0.02	0.48	−0.13	0.66	−0.55	2.33	+2.79
1.71	(1)	4.48	+1.62	2.98	−0.79	5.26	+1.43	1.94	−1.61	3.65	−2.61	1.82	−0.89
2.86	+1.24	6.10	+5.52	5.51	−1.73	9.02	−0.82	10.32	+2.42	11.59	+0.26	7.80	+1.54
3.06	−0.98	1.98	+0.21	2.22	−0.70	5.18	−2.74	5.92	−3.34	7.07	+0.10	6.88	−1.10
1.12	−0.35	1.64	+2.86	2.48	−1.03	2.86	+2.18	1.32	+0.14	0.82	−0.22	0.66	−0.46
2.29	+0.48	5.56	−0.78	6.10	+0.84	10.78	+2.42	10.64	+3.92	12.98	+3.33	11.43	+4.34
4.82	+7.59	2.51	+1.80	3.41	+1.49	8.84	+2.39	11.04	+0.81	9.40	+10.49	12.43	+15.74
1.67	−1.41	1.94	+0.33	2.07	−0.36	2.23	−0.53	3.02	+0.24	2.59	+0.80	1.63	−0.67

[1] Record incomplete

[2] Inappreciable.

APPENDIX 28.

Average precipitation at selected stations of the Signal Service, United States Army, for each month and the year. (Computed for the decade ending December 31, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Eastport, Me	3.32	4.48	5.52	3.66	4.70	3.98	5.38	3.16	3.57	4.56	4.72	4.28	51.22
Portland, Me	3.49	3.85	3.84	3.08	3.19	3.58	3.69	2.65	2.97	3.23	3.52	3.57	40.64
Mount Washington, N. H	4.43	4.60	7.44	6.80	7.38	8.81	11.66	7.74	9.21	7.91	7.74	6.44	90.13
Boston, Mass	4.37	3.97	5.55	4.00	3.21	3.64	4.04	3.46	3.05	4.10	5.04	3.59	48.02
New Haven, Conn	3.90	4.47	5.70	3.71	3.30	3.48	5.29	4.46	4.08	3.68	3.98	3.66	49.70
New London, Conn	4.47	4.19	5.56	3.60	3.18	3.95	5.03	4.27	3.45	3.97	3.75	3.53	49.07
Middle Atlantic States:													
Albany, N. Y	2.65	2.84	3.04	2.58	3.02	4.02	4.30	3.49	3.43	3.21	2.61	2.95	38.15
New York City	3.82	3.76	4.47	2.90	2.68	3.31	4.37	4.68	3.56	2.93	3.24	3.75	43.48
Philadelphia, Pa	3.30	3.40	3.60	2.36	2.50	3.84	3.85	3.94	3.47	2.33	2.98	2.82	38.40
Atlantic City, N. J	4.05	3.53	4.37	3.43	2.32	3.38	3.31	5.51	3.81	2.92	3.56	4.47	44.16
Barnegat City, N. J	4.95	3.78	5.27	2.90	2.53	3.85	4.11	5.10	4.63	3.58	4.27	4.63	49.60
Cape May, N. J	4.29	3.49	5.56	3.08	2.49	3.87	3.38	6.54	3.88	3.40	3.60	4.77	48.34
Sandy Hook, N. J	4.23	3.73	5.68	3.75	4.14	4.50	4.62	4.98	4.04	3.51	4.17	4.15	51.53
Baltimore, Md	3.55	3.54	4.70	3.04	2.81	4.47	4.73	3.88	4.07	2.64	2.97	3.69	44.07
Washington City	3.86	3.44	4.56	2.97	2.90	4.92	4.69	4.97	3.97	2.85	2.90	3.77	45.81
Cape Henry, Va	5.22	3.21	6.30	5.32	3.06	3.85	6.80	5.28	5.43	4.81	4.12	4.42	56.82
Lynchburg, Va	4.21	3.31	4.40	3.13	2.35	3.32	2.94	3.90	3.81	3.06	3.42	4.74	42.59
Norfolk, Va	4.46	2.98	4.68	4.34	3.13	4.31	5.42	5.84	5.07	3.43	3.09	3.59	50.33
South Atlantic States:													
Hatteras, N. C	6.50	5.25	7.84	5.78	3.89	4.73	6.64	6.24	7.34	7.06	6.51	6.76	74.54
Wilmington, N. C	4.02	2.79	4.40	3.78	3.23	7.14	7.02	8.18	7.91	4.06	2.66	3.58	58.78
Charleston, S. C	4.22	2.92	4.15	5.65	3.87	6.11	7.70	6.03	6.55	5.28	3.24	3.66	59.37
Augusta, Ga	4.74	3.32	5.49	4.81	2.24	4.38	4.16	4.54	3.98	2.30	3.90	4.08	47.94
Savannah, Ga	3.93	2.36	3.42	5.28	2.30	7.07	4.42	6.49	5.05	4.19	2.33	3.78	50.64
Jacksonville, Fla	3.59	3.32	2.54	4.03	3.88	5.02	5.00	7.20	6.99	7.42	3.26	3.02	55.29
Florida Peninsula:													
Key West, Fla	2.31	1.61	0.75	1.58	4.51	4.41	3.72	5.78	6.93	6.96	2.83	1.59	42.97
Eastern Gulf States:													
Montgomery, Ala	4.63	4.96	6.01	6.25	3.22	4.20	3.58	3.65	2.98	3.05	3.34	5.85	52.31
Vicksburg, Miss	5.81	5.60	7.04	5.81	5.17	3.79	4.15	4.04	4.75	4.13	6.62	6.30	63.21
New Orleans, La	5.76	4.79	5.67	6.62	5.02	5.68	6.34	5.46	4.41	3.58	5.40	6.01	64.74
Western Gulf States:													
Shreveport, La	4.98	4.67	4.92	5.83	5.31	2.98	4.07	2.40	4.82	4.05	5.43	5.56	54.52
Galveston, Tex	4.12	3.21	3.21	3.37	4.52	3.40	3.13	5.27	6.82	5.84	4.86	5.22	52.98
Indianola, Tex	2.05	1.80	2.46	1.79	3.54	2.39	2.06	4.46	6.49	4.69	3.26	2.69	37.68
Ohio Valley and Tennessee:													
Knoxville, Tenn	6.90	4.98	6.44	5.18	3.08	4.10	5.11	3.87	2.74	3.22	4.20	4.57	54.39
Memphis, Tenn	6.58	5.80	6.13	3.58	5.25	5.63	3.17	3.17	2.61	3.83	5.18	4.56	55.50
Nashville, Tenn	5.90	5.41	5.89	5.37	3.52	4.36	5.51	3.80	3.63	3.25	3.96	4.14	54.74
Louisville, Ky	4.34	4.77	4.56	4.13	3.95	4.53	4.71	3.75	3.01	3.68	3.91	4.56	49.90
Indianapolis, Ind	2.69	4.06	4.29	3.28	4.74	6.16	5.04	3.29	2.92	3.91	4.03	3.62	48.02
Cincinnati, Ohio	3.99	4.36	4.35	3.14	4.11	5.54	4.03	4.23	2.47	3.25	3.32	4.09	46.87
Pittsburg, Pa	3.20	2.74	3.41	2.16	2.90	3.86	4.56	2.92	3.00	2.26	2.62	3.10	36.74
Lower Lakes:													
Buffalo, N. Y	2.75	2.76	3.05	2.25	3.23	3.33	3.46	2.91	3.12	3.88	3.48	3.78	38.01
Oswego, N. Y	3.37	3.11	3.27	1.84	3.14	3.32	2.98	2.49	2.57	3.26	3.72	4.41	37.48
Erie, Pa	3.23	3.30	3.40	2.62	3.72	4.15	2.94	2.94	4.36	4.28	4.75	3.46	43.15
Cleveland, Ohio	2.42	3.12	3.28	2.28	3.40	4.37	4.17	2.95	4.33	3.29	2.81	2.91	39.33
Toledo, Ohio	1.92	2.07	2.36	1.93	3.47	3.81	3.81	3.04	2.72	3.25	2.94	2.47	33.80
Detroit, Mich	1.93	2.91	3.21	2.21	3.74	3.68	4.60	3.37	2.83	3.36	2.90	2.87	37.61
Upper Lakes:													
Alpena, Mich	2.17	2.46	2.10	1.80	4.02	4.34	3.72	3.76	4.69	5.04	3.14	2.70	39.95
Escanaba, Mich	1.45	1.61	1.85	2.16	3.70	5.06	3.10	4.72	4.69	4.56	2.65	2.04	37.60
Marquette, Mich	1.32	1.72	1.56	1.98	2.96	4.46	3.10	3.36	5.25	4.10	2.66	2.69	35.15
Port Huron, Mich	1.92	2.40	3.86	2.25	3.10	3.88	2.94	3.03	2.54	3.44	2.70	2.59	34.65
Chicago, Ill	1.70	2.87	3.18	3.48	3.76	4.62	4.50	2.78	2.45	4.43	3.12	2.24	39.13
Milwaukee, Wis	1.92	2.47	3.20	3.18	3.66	4.38	3.72	2.76	2.71	3.13	2.22	1.94	35.28
Duluth, Minn	0.95	1.28	1.70	2.37	4.47	4.07	3.57	3.68	4.52	3.40	1.76	1.61	33.96
Upper Mississippi Valley:													
Saint Paul, Minn	1.07	1.19	1.54	1.90	3.48	4.05	3.33	3.58	3.08	2.30	1.26	1.45	28.23
La Crosse, Wis	1.18	1.32	1.96	2.12	3.54	4.52	5.54	3.87	5.24	2.92	2.00	1.49	35.71
Davenport, Iowa	1.37	1.88	2.61	2.83	4.37	5.49	4.35	3.25	3.16	3.70	2.12	1.71	36.83
Dubuque, Iowa	1.33	1.70	2.56	3.04	4.31	5.88	5.90	3.40	4.95	3.42	2.24	1.89	40.62
Keokuk, Iowa	1.34	2.10	2.64	2.84	4.57	6.06	4.62	3.20	3.66	3.76	2.21	1.97	38.96
Cairo, Ill	4.56	4.30	4.25	3.85	4.40	5.04	4.82	3.13	2.39	3.46	4.24	3.84	48.27
Saint Louis, Mo	1.94	3.50	3.23	3.42	3.48	5.17	4.18	2.59	3.02	3.16	3.07	2.53	39.43

Average precipitation at selected stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In*	*In.*	*In.*	*In.*	*In.*
Missouri Valley:													
Leavenworth, Kans	1.09	1.72	2.57	3.60	5.06	6.09	5.13	3.07	3.11	3.78	2.64	1.54	39.40
Omaha, Nebr	0.62	0.88	1.84	3.39	5.52	7.49	6.22	4.18	3.54	3.42	1.22	0.95	39.22
Yankton, Dak	0.58	0.90	1.24	3.50	4.54	5.01	4.43	2.43	2.99	1.85	0.36	0.80	28.64
Extreme Northwest:													
Bismarck, Dak	0.56	0.68	1.15	2.86	3.28	3.64	2.35	2.82	1.44	1.84	0.56	0.85	21.48
Northern Slope:													
Cheyenne, Wyo	0.34	0.15	0.62	1.07	2.45	1.27	1.58	1.56	0.94	0.74	0.26	0.26	11.25
North Platte, Nebr	0.60	0.39	0.64	1.84	3.09	3.72	2.96	2.29	1.40	1.82	0.29	0.79	19.82
Middle Slope:													
Denver, Colo	0.70	0.50	0.88	1.76	3.43	1.52	1.53	1.64	0.78	0.76	0.81	0.84	15.15
Pike's Peak, Colo	1.64	1.29	2.06	3.14	4.11	1.96	4.38	4.20	1.90	1.46	2.26	1.44	29.84
Dodge City, Kans	0.26	0.55	0.82	1.24	4.35	3.06	3.40	3.45	1.07	1.45	0.70	0.78	21.11
Middle Plateau:													
Salt Lake City, Utah	1.33	1.37	2.08	2.60	2.07	0.67	0.41	0.76	0.91	1.81	1.40	1.55	16.97
North Pacific Coast:													
Portland, Oreg	6.78	7.92	6.68	3.64	2.51	1.61	0.89	0.83	2.07	5.74	7.71	8.76	55.04
Middle Pacific Coast:													
San Francisco, Cal	5.38	4.10	3.89	2.57	0.84	0.44	(1)	0.01	0.22	1.36	2.20	3.36	24.88
South Pacific Coast:													
San Diego, Cal	1.90	2.34	1.62	1.02	0.48	0.09	0.01	0.06	0.05	0.57	0.62	2.38	11.14

[1] Inappreciable.

APPENDIX 29.

Average precipitation at selected stations of the Signal Service, United States Army, for each month and the year. (Computed from January, 1880, to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Eastport, Me	3.44	5.21	5.15	3.35	4.09	4.01	5.91	2.29	3.25	4.52	3.92	5.13	52.66
Portland, Me	4.22	4.82	3.38	2.70	4.06	2.91	4.18	1.75	3.35	3.15	2.64	4.32	41.50
Mount Washington, N. H	4.40	5.66	7.25	5.87	9.11	8.78	12.45	7.06	9.83	10.20	7.89	6.75	95.19
Boston. Mass	4.89	4.45	4.73	2.92	4.05	3.18	4.14	2.20	3.52	3.57	2.47	3.61	43.68
New Haven, Conn	4.54	5.01	5.10	2.81	3.60	3.24	4.60	3.55	4.49	3.75	2.42	4.30	46.91
New London, Conn	5.32	5.48	5.10	3.83	4.35	4.07	5.04	4.12	3.60	4.51	2.99	4.11	52.21
Middle Atlantic States:													
Albany, N. Y	2.77	3.07	2.71	2.02	3.48	3.61	4.19	3.05	3.60	2.41	2.30	2.98	36.18
New York City	4.61	4.24	3.96	2.56	2.95	3.78	4.05	3.69	4.37	2.90	2.43	4.16	43.70
Philadelphia, Pa	3.87	4.43	3.53	1.85	2.72	3.27	3.14	4.07	3.71	2.37	1.68	2.94	37.58
Atlantic City, N. J	5.64	4.97	4.60	3.30	2.18	3.16	3.38	5.87	3.37	3.81	2.92	4.79	47.99
Barnegat City, N. J	5.53	4.94	4.84	2.74	2.53	3.89	3.57	5.41	5.45	4.25	2.81	4.55	50.49
Cape May, N. J	5.28	4.35	5.61	2.50	2.31	3.63	3.22	5.67	3.22	4.20	3.52	5.17	48.67
Sandy Hook, N. J	4.68	4.17	4.51	3.25	4.50	4.38	3.99	3.28	4.61	3.81	2.78	3.66	47.55
Baltimore, Md	4.09	4.55	5.18	2.61	2.27	5.24	4.88	3.23	3.54	2.36	2.08	3.88	43.91
Washington City	4.70	4.55	5.29	2.88	3.16	5.41	4.10	2.73	3.38	2.10	2.17	4.02	44.70
Cape Henry, Va	5.64	3.54	6.23	5.10	2.14	4.03	6.69	4.43	3.19	4.59	4.20	4.03	53.80
Lynchburg, Va	5.01	4.14	4.97	3.15	2.29	3.62	3.25	2.74	3.86	2.44	2.49	5.72	43.68
Norfolk, Va	4.84	3.31	4.84	4.17	2.65	5.03	6.03	4.41	4.32	3.29	2.97	3.92	49.78
South Atlantic States:													
Charlotte, N. C	6.59	4.86	6.39	5.33	2.57	4.52	5.19	4.03	3.77	3.52	4.30	4.99	56.06
Hatteras, N. C	7.21	5.30	7.44	4.70	3.53	4.70	7.84	6.67	5.33	6.48	7.85	5.22	72.28
Kitty Hawk, N. C	6.37	3.91	6.69	5.67	2.63	4.58	9.01	8.29	4.26	3.92	5.56	5.06	65.95
Smithville, N. C	4.71	2.75	4.09	3.54	1.96	2.92	5.98	5.45	4.36	4.06	2.74	3.18	46.34
Wilmington, N. C	4.42	2.69	5.20	3.34	2.77	6.43	8.70	7.83	6.78	3.21	2.68	2.82	56.38
Charleston, S. C	3.95	2.37	4.26	3.33	2.80	4.78	6.91	7.16	5.92	3.80	2.75	3.65	51.69
Augusta, Ga	5.54	3.35	6.18	5.03	2.74	3.59	3.75	4.23	3.35	1.98	3.68	4.06	47.46
Savannah, Ga	4.29	2.13	3.47	3.69	2.28	5.29	4.05	7.30	4.45	3.53	2.16	4.26	46.90
Jacksonville, Fla	4.88	2.26	2.39	3.62	3.93	4.98	6.44	7.54	5.43	8.16	4.14	2.59	56.36
Florida Peninsula:													
Cedar Keys, Fla	5.26	2.70	3.81	2.98	2.57	6.15	8.48	9.47	5.52	3.35	3.37	3.56	56.70
Key West, Fla	2.16	0.72	0.49	2.15	5.05	4.12	3.78	5.68	6.54	6.51	3.28	1.45	41.93
Eastern Gulf States:													
Atlanta, Ga	7.73	6.57	8.09	6.19	2.43	4.46	2.76	3.67	2.99	1.96	4.86	5.71	57.42
Pensacola, Fla	5.08	4.48	4.37	5.00	4.97	5.63	6.42	10.48	6.73	4.28	5.10	6.00	68.56
Montgomery, Ala	4.36	5.85	6.95	5.44	3.04	4.64	3.06	3.60	2.46	2.33	2.98	5.51	50.22
Vicksburg, Miss	6.98	6.48	6.73	5.49	6.52	3.86	5.88	3.33	4.81	5.02	7.72	7.01	68.83
New Orleans, La	6.34	3.84	4.72	7.26	5.26	6.53	6.50	4.65	3.38	3.58	4.95	5.76	62.78
Western Gulf States:													
Shreveport, La	4.62	6.83	4.35	5.55	6.46	2.74	5.16	1.67	4.40	3.85	5.28	6.03	56.92
Little Rock, Ark	4.75	8.66	5.03	6.28	7.07	3.28	3.90	3.14	3.71	3.94	5.09	5.50	60.35
Galveston, Tex	4.86	3.61	3.87	2.82	5.15	4.48	2.86	4.06	5.76	6.70	4.61	4.36	53.14
Indianola, Tex	2.55	1.55	2.46	1.81	4.76	2.91	1.90	4.87	8.06	4.12	3.28	1.65	39.93
Rio Grande Valley:													
Brownsville, Tex	2.37	0.90	1.00	0.58	3.75	2.22	2.02	4.93	5.26	6.62	3.45	1.76	34.86
Ohio Valley and Tennessee:													
Chattanooga, Tenn	7.82	5.67	7.74	6.41	3.96	4.81	3.82	4.15	3.98	3.05	4.99	5.50	61.40
Knoxville, Tenn	7.63	5.34	6.56	5.14	3.18	4.08	5.75	3.90	2.66	3.06	4.06	4.20	55.55
Memphis, Tenn	6.92	8.70	6.13	5.29	5.75	4.82	2.26	2.32	2.77	4.78	5.36	4.36	59.48
Nashville, Tenn	6.55	8.51	6.64	5.52	4.72	4.11	3.73	3.37	3.63	4.17	3.79	3.69	58.22
Louisville, Ky	3.92	7.54	4.09	4.50	4.85	3.74	3.52	2.82	2.99	4.29	3.44	4.30	49.98
Indianapolis, Ind	2.91	5.76	4.08	3.67	5.69	6.09	3.73	2.22	2.33	4.54	4.54	3.95	49.50
Cincinnati, Ohio	3.99	6.72	3.99	3.70	5.49	5.68	2.49	2.93	2.47	4.06	3.23	4.38	49.13
Columbus, Ohio	3.38	4.64	3.60	3.39	4.99	4.03	3.74	3.08	2.43	4.24	3.36	3.69	44.57
Pittsburg, Pa	3.84	3.74	3.22	2.08	3.65	4.21	3.51	3.07	2.32	2.55	1.83	3.16	37.18
Lower Lakes:													
Buffalo, N. Y	2.47	3.28	2.48	1.88	4.50	3.67	3.03	3.16	2.05	3.68	3.06	3.62	36.83
Oswego, N. Y	3.87	3.72	3.44	1.56	4.14	3.21	1.94	2.38	1.79	2.92	3.42	4.52	36.91
Erie, Pa	3.24	4.12	2.81	2.67	4.10	3.94	3.50	2.76	3.91	3.94	4.34	3.70	43.04
Cleveland, Ohio	2.04	4.11	2.44	2.35	3.85	4.76	3.96	2.83	3.44	3.02	2.37	2.66	37.84
Toledo, Ohio	1.91	3.00	1.99	2.31	3.92	4.09	4.58	2.45	2.49	3.98	2.72	2.18	35.47
Detroit, Mich	2.19	3.29	2.62	2.55	3.92	4.04	3.59	2.74	2.62	3.78	2.60	2.52	36.34

Average precipitation at selected stations of the Signal Service, &c.—Continued.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Upper Lakes:	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Alpena, Mich	2.68	2.85	2.45	1.89	2.94	5.30	3.59	3.06	3.85	4.49	3.08	2.87	41.04
Escanaba, Mich	1.95	1.89	1.44	1.58	3.96	5.03	2.99	4.14	5.62	4.72	2.81	2.26	38.40
Grand Haven, Mich	2.75	3.66	3.19	3.17	3.81	5.24	4.99	3.09	3.54	5.12	3.23	3.44	45.28
Marquette, Mich	1.80	2.15	1.79	2.32	3.45	3.49	3.09	3.56	5.92	3.98	2.43	3.09	37.07
Port Huron, Mich	2.36	3.17	3.26	2.46	3.58	4.59	3.17	3.07	2.00	3.66	2.53	2.88	36.28
Chicago, Ill	1.82	3.83	2.85	4.11	4.24	4.57	4.01	2.74	2.23	4.87	3.08	2.29	40.62
Milwaukee, Wis	1.69	2.89	2.68	2.19	3.01	4.31	4.21	2.15	2.52	3.70	1.56	1.60	31.50
Duluth, Minn	1.04	1.77	1.73	2.32	4.09	4.98	2.93	4.62	4.32	3.36	1.94	1.43	34.55
Upper Mississippi Valley:													
Saint Paul, Minn	1.39	1.54	1.60	2.12	2.72	4.34	3.09	2.95	3.73	2.43	1.51	1.55	28.97
La Crosse, Wis	1.14	1.19	1.50	2.15	3.13	4.20	6.13	3.44	6.07	3.33	1.64	1.08	35.20
Davenport, Iowa	1.46	2.38	2.58	2.57	4.23	6.21	3.56	2.78	3.47	4.77	2.00	1.66	37.86
Des Moines, Iowa	1.09	1.70	1.51	2.97	6.46	8.73	4.74	4.36	3.51	5.41	2.27	1.64	44.38
Dubuque, Iowa	1.45	2.03	2.40	2.80	4.42	6.02	5.75	3.77	5.17	4.25	1.99	2.11	42.15
Keokuk, Iowa	1.51	2.81	2.40	3.08	4.48	6.22	3.06	2.36	2.97	4.61	1.96	1.85	37.33
Cairo, Ill	3.91	6.84	3.28	4.06	5.14	3.43	5.01	2.13	3.19	4.23	4.34	3.95	49.50
Springfield, Ill	1.90	5.69	3.36	3.19	5.92	6.95	2.89	2.29	3.74	4.93	3.18	3.48	47.52
Saint Louis, Mo	1.77	5.21	2.65	3.50	3.50	3.86	3.66	1.72	2.80	4.16	3.73	2.59	39.16
Missouri Valley:													
Leavenworth, Kans	1.00	2.85	2.07	2.62	4.66	5.24	5.61	3.45	3.51	4.80	2.28	0.97	37.89
Omaha, Nebr	0.80	1.27	1.49	3.23	5.80	7.91	6.63	4.03	4.24	4.46	1.00	0.84	41.71
Yankton, Dak	0.64	1.10	1.02	3.45	5.87	3.90	3.49	2.18	2.78	2.67	0.80	0.72	28.13
Extreme Northwest:													
Bismarck, Dak	0.37	0.55	0.67	2.40	2.44	3.56	2.51	2.58	1.22	1.40	0.53	0.94	19.17
Buford, Fort, Dak	0.89	0.48	0.62	0.96	1.47	2.55	2.26	1.33	1.05	0.83	0.36	0.84	13.61
Northern Slope:													
Custer, Fort, Mont	1.33	0.50	0.53	1.17	3.21	2.51	1.21	1.16	0.89	0.78	0.56	0.96	14.80
Deadwood, Dak	1.12	0.99	1.62	3.78	5.05	3.98	2.64	2.05	0.90	1.00	1.29	1.21	25.63
Cheyenne, Wyo	0.47	0.17	0.58	1.41	2.56	1.86	1.53	1.74	1.06	0.82	0.21	0.33	12.74
North Platte, Nebr	0.39	0.51	0.75	1.64	3.51	4.59	2.44	2.61	1.07	2.08	0.21	0.58	20.38
Middle Slope:													
Denver, Colo	0.80	0.61	0.48	1.74	3.04	1.72	1.49	1.49	0.55	0.83	0.75	0.78	14.28
Pike's Peak, Colo	1.85	1.28	2.18	2.12	4.78	1.49	4.23	4.26	1.67	1.61	1.85	0.98	28.30
Dodge City, Kans	0.24	0.71	0.62	1.33	5.92	3.37	4.22	3.82	1.08	2.01	0.89	0.58	24.78
Elliott, Fort, Tex	0.28	0.35	0.26	0.80	5.62	2.93	3.04	3.18	2.54	3.25	0.73	0.98	23.97
Southern Slope:			3										
Concho, Fort, Tex	1.50	1.47	1.5	1.70	6.05	2.06	4.40	4.21	4.35	4.33	1.40	1.62	34.72
Stockton, Fort, Tex	0.45	0.55	0.45	0.48	1.60	2.08	2.91	3.73	3.47	2.24	1.05	0.80	24.61
Southern Plateau:													
El Paso, Tex	0.53	0.45	0.62	0.27	0.39	0.12	3.86	2.98	1.77	1.82	0.56	1.04	14.41
Apache, Fort, Ariz	1.17	2.17	2.16	0.96	0.69	1.22	4.37	5.39	1.82	1.73	0.81	2.43	24.93
Grant, Fort, Ariz	0.77	1.62	1.74	0.30	0.61	1.05	3.35	3.88	1.41	1.35	0.30	1.05	18.13
Prescott, Ariz	0.72	1.90	2.17	0.79	0.50	0.18	2.36	3.24	1.37	0.55	0.49	2.46	16.72
Middle Plateau:													
Salt Lake City, Utah	1.04	1.37	1.57	2.87	1.48	0.64	0.22	1.06	0.68	1.62	1.09	1.48	15.11
Northern Plateau:													
Lewiston, Idaho	2.39	1.85	1.18	1.31	1.00	1.88	0.87	0.30	0.62	1.96	1.40	3.28	18.05
Dayton, Wash	3.92	4.04	1.99	3.09	1.77	1.10	0.70	0.41	0.82	2.80	2.09	5.06	27.77
North Pacific Coast:													
Olympia, Wash	9.17	7.68	3.28	5.27	2.39	1.56	0.55	0.54	2.01	5.20	4.41	9.36	51.42
Portland, Oreg	8.66	7.35	3.70	4.50	1.87	1.47	0.90	0.80	1.96	5.52	5.74	10.91	53.40
Middle Pacific Coast:													
Red Bluff, Cal	3.78	2.20	3.06	3.45	1.06	0.33	(1)	(1)	0.59	1.61	1.34	5.65	23.02
Sacramento, Cal	3.07	2.97	3.74	4.56	0.80	0.41	(1)	(1)	0.47	1.23	1.15	5.42	23.83
San Francisco, Cal	3.69	3.43	3.54	4.22	1.06	0.66	(1)	0.01	0.25	1.46	1.66	5.36	25.34
South Pacific Coast:													
Los Angeles, Cal	1.71	4.28	4.20	2.22	0.62	0.28	(1)	(1)	(1)	0.56	0.77	3.24	17.89
San Diego, Cal	1.62	2.90	2.19	1.26	0.72	0.11	0.02	0.07	0.02	0.71	0.22	2.30	12.14

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(1) Inappreciable.

APPENDIX 30.

Annual and mean annual precipitation, at stations of the Signal Service, United States Army, compiled from the commencement of observations to 1884, inclusive.

Stations.	Established.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean annual.	
																Years.	Inches
New England:		*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*		
Eastport, Me	Apr. 1, 1873	......	......	......	42.56	45.42	57.99	50.62	51.37	43.48	42.44	55.98	47.18	53.17	64.53	11	50.43
Portland, Me	Jan. 15, 1871	......	37.02	36.90	36.24	36.14	39.04	43.51	38.60	41.61	37.59	46.68	38.74	31.99	52.51	13	39.74
Mount Washington, N. H	Dec. 1, 1870	......	56.51	78.56	70.72	55.78	77.56	86.41	114.42	91.11	79.93	121.13	97.41	76.71	100.78	13	85.16
Boston, Mass	Nov. 1, 1870	46.97	50.62	54.53	43.52	50.15	48.96	51.49	65.53	45.67	37.30	52.63	43.82	35.48	49.18	14	48.28
Block Island, R. I	Sept. 1, 1880	......	......	......	......	......	......	......	......	......	......	59.44	57.65	39.69	63.15	4	54.98
New Haven, Conn	Dec. 10, 1872	......	......	57.32	55.82	43.52	53.98	51.36	58.12	55.50	46.52	51.32	47.92	39.46	49.33	12	50.85
New London, Conn	Jan. 10, 1871	42.50	47.01	42.26	59.59	44.79	43.20	51.31	39.35	51.05	43.23	51.64	50.46	54.37	61.33	14	48.72
Middle Atlantic States:																	
Albany, N. Y	Dec. 22, 1873	......	......	......	37.98	38.25	38.19	36.09	49.37	38.66	32.54	36.34	33.76	39.37	38.90	11	38.13
New York City	Nov. 1, 1870	48.80	45.79	39.98	40.84	45.09	47.40	40.94	46.67	36.13	37.34	40.40	46.61	38.83	55.34	14	43.58
Philadelphia, Pa	Jan. 1, 1871	......	48.86	55.28	46.25	40.22	47.39	37.26	34.53	36.75	33.58	30.21	45.58	39.17	39.84	13	41.07
Atlantic City, N. J	Dec. 10, 1873	......	......	......	33.98	39.85	35.95	36.38	42.00	47.43	46.25	40.08	55.29	44.64	58.70	11	43.23
Barnegat City, N. J	Dec. 10, 1873	......	......	......	55.93	46.73	47.17	48.24	52.06	49.35	48.81	53.28	72.90	42.96	34.52	11	50.18
Cape May, N. J	May 24, 1871	......	36.67	49.76	44.26	50.89	45.88	47.68	45.22	50.38	53.30	42.99	51.96	52.62	42.50	13	47.24
Sandy Hook, N. J	Dec. 10, 1873	......	......	......	51.20	48.81	57.26	53.65	61.70	56.50	41.06	46.74	52.14	44.09	53.73	11	51.49
Delaware Breakwater, Del	Jan. 28, 1880	......	......	......	......	......	......	......	......	......	......	25.50	35.95	33.84	35.17	4	32.62
Baltimore, Md	Jan. 1, 1871	32.74	35.14	49.37	33.63	45.26	46.70	43.14	50.09	36.01	41.90	49.12	42.11	40.52	45.88	14	42.26
Washington City	Nov. 1, 1870	37.98	30.86	45.70	34.58	41.11	47.96	52.59	60.09	32.83	38.83	42.20	46.79	45.71	49.96	14	43.37
Cape Henry, Va	Dec. 15, 1873	......	......	......	51.00	59.60	64.17	64.67	60.85	49.88	63.06	50.18	57.51	57.26	41.01	11	56.29
Chincoteague, Va	Mar. 16, 1880	......	......	......	......	......	......	......	......	......	......	35.34	35.10	42.35	41.11	4	38.48
Lynchburg, Va	May 24, 1871	......	30.55	52.61	44.35	41.89	40.04	43.75	45.04	36.81	38.78	35.57	46.90	39.85	57.28	13	42.57
Norfolk, Va	Jan. 1, 1871	56.65	56.95	55.43	50.41	50.97	46.54	60.18	51.87	35.88	51.84	40.06	57.67	54.30	45.05	14	51.62
South Atlantic States:																	
Charlotte, N. C	Oct. 6, 1878	......	......	......	......	......	......	......	......	44.84	59.60	41.62	53.53	57.09	68.44	6	54.10
Hatteras, N. C	Dec. 1, 1880	......	......	......	......	68.26	65.78	102.04	77.18	70.72	92.64	58.81	66.60	76.96	66.41	10	74.54
Kitty Hawk, N. C	Jan. 15, 1875	......	......	......	......	......	57.11	80.70	63.10	51.25	68.72	51.71	73.79	72.86	62.65	9	64.65
Macon, Fort, N. C	May 23, 1878	......	......	......	......	......	......	......	......	......	......	62.35	61.63	67.45	45.23	4	59.16
Smithville, N. C	Oct. 15, 1875	......	......	......	......	......	56.23	65.01	56.88	49.08	50.13	50.64	48.27	46.67	36.00	9	50.99
Wilmington, N. C	Jan. 1, 1871	51.37	59.18	58.37	52.42	49.59	66.73	83.65	54.73	51.14	51.91	51.02	52.29	64.00	62.70	14	57.79
Charleston, S. C	Jan. 5, 1871	63.87	57.06	62.15	62.51	50.97	78.42	78.11	77.44	50.29	46.60	43.20	57.01	51.35	60.22	14	59.91
Augusta, Ga	Nov. 2, 1870	53.58	55.17	48.50	57.19	54.68	46.16	53.97	46.34	40.99	47.91	54.77	49.62	39.90	45.10	14	49.56
Savannah, Ga	Jan. 1, 1871	61.66	63.87	48.39	57.48	49.00	64.85	59.60	52.58	45.81	50.26	38.00	47.35	48.43	50.47	14	52.69
Jacksonville, Fla	Sept. 11, 1871	......	57.17	60.65	48.31	57.60	55.28	50.58	60.42	47.18	65.51	54.69	58.26	58.34	56.02	13	55.81
Florida Peninsula:																	
Cedar Keys, Fla	Nov. 7, 1879	......	......	......	......	......	......	......	......	......	82.30	53.03	66.90	33.56	47.03	5	56.70
Key West, Fla	Nov. 1, 1870	34.68	31.77	32.75	32.75	36.35	37.95	33.15	49.03	58.54	33.41	53.10	41.36	48.24	33.05	14	40.12
Sanford, Fla	Sept. 1, 1882	......	......	......	......	......	......	......	......	......	......	......	......	44.61	46.81	2	45.71

Eastern Gulf States:																
Atlanta, Ga	Sept. 25, 1878	......	......	......	......	......	......	......	......	50.81	62.70	61.74	58.30	51.58	58.85	6	56.23
Pensacola, Fla	Oct. 27, 1879	......	......	......	......	......	......	......	......	......	61.30	66.02	72.01	61.55	61.90	5	63.56
Mobile, Ala	Nov. 7, 1870	61.98	68.20	66.61	58.98	62.78	58.60	68.74	63.47	57.38	(1)	90.97	74.67	58.50	67.55	13	65.97
Montgomery, Ala	Nov. 9, 1870	......	......	64.00	51.98	58.16	59.74	50.26	55.40	48.46	54.22	58.81	54.75	39.71	48.61	12	53.25
Vicksburg, Miss	Sept. 10, 1871	......	58.27	41.45	66.10	70.05	51.79	52.96	60.86	52.81	84.19	51.94	71.56	68.75	72.70	13	61.38
New Orleans, La	Nov. 1, 1870	64.62	60.68	65.55	62.74	85.78	67.25	68.09	66.16	51.27	69.83	64.01	50.18	69.85	60.01	14	64.86
Western Gulf States:																
Shreveport, La	Sept. 8, 1871	......	51.03	52.87	54.80	50.98	54.49	47.71	55.83	41.59	66.60	53.72	65.11	48.11	66.08	13	54.11
Fort Smith, Ark	June 1, 1882	......	......	......	......	......	......	......	......	......	......	......	......	46.65	50.63	2	48.64
Little Rock, Ark	July 1, 1879	......	......	......	......	......	......	......	......	......	56.85	48.03	75.54	55.62	71.20	5	60.85
Galveston, Tex	Apr. 19, 1871	......	41.72	58.91	49.39	58.48	50.92	66.87	60.90	26.98	50.97	53.28	57.68	41.11	62.68	13	52.80
Indianola, Tex	May 1, 1872	......	......	48.30	44.51	35.39	32.57	42.67	39.74	26.78	45.17	37.70	41.90	30.69	44.17	12	38.72
Palestine, Tex	Dec. 8, 1881	......	......	......	......	......	......	......	......	......	......	......	......	48.49	51.64	2	47.56
Rio Grande Valley:																
Brownsville, Tex	Aug. 25, 1875	......	......	......	......	......	25.81	25.86	36.35	34.73	38.07	31.74	32.56	31.02	40.91	9	33.01
Rio Grande City, Tex	May 28, 1875	......	......	......	......	......	......	15.83	24.43	25.61	22.31	28.13	(1)	(1)	18.84	6	22.52
Ohio Valley and Tennessee:																
Chattanooga, Tenn	Jan. 8, 1879	......	......	......	......	......	......	......	......	52.03	67.97	60.97	61.96	54.16	61.96	6	59.84
Knoxville, Tenn	Jan. 1, 1871	48.22	44.22	59.38	58.38	73.87	41.21	54.36	47.76	48.95	52.54	45.67	66.36	50.67	62.53	14	53.87
Memphis, Tenn	Feb. 28, 1871	......	43.95	56.20	44.07	57.02	55.49	73.30	49.83	52.29	61.67	42.84	71.05	57.14	64.69	13	56.10
Nashville, Tenn	Nov. 1, 1870	......	40.20	51.69	58.24	53.48	46.91	49.64	48.56	57.69	67.24	48.08	63.45	58.33	54.02	13	53.66
Louisville, Ky	Sept. 11, 1871	......	......	45.77	43.69	53.21	53.62	44.58	47.06	50.69	58.85	36.59	56.50	51.54	51.41	12	49.04
Indianapolis, Ind	Feb. 10, 1871	......	34.12	52.83	43.92	54.58	57.56	39.08	38.62	42.88	50.99	48.74	53.68	54.12	39.99	13	47.01
Cincinnati, Ohio	Nov. 1, 1870	30.07	34.68	41.88	37.55	42.58	52.62	34.65	41.62	51.60	54.67	47.24	52.12	52.85	39.28	14	43.74
Columbus, Ohio	July 1, 1878	......	......	......	......	......	......	......	......	31.26	44.68	46.99	51.30	48.88	31.02	6	42.36
Pittsburg, Pa	Nov. 1, 1870	......	31.05	41.42	39.42	34.05	37.01	34.72	38.76	37.02	31.97	37.30	38.63	43.17	34.82	13	36.87
Lower Lakes:																
Buffalo, N. Y	Nov. 1, 1870	32.40	31.25	44.68	30.44	31.44	39.26	34.48	60.24	30.47	39.26	35.95	38.82	38.07	37.07	14	37.06
Oswego, N. Y	Nov. 1, 1870	29.20	27.61	33.29	34.93	31.41	34.20	32.20	55.83	36.60	43.19	39.25	36.13	34.49	31.47	14	35.70
Rochester, N. Y	Nov. 1, 1870	36.84	36.29	49.89	35.62	29.93	35.82	34.12	48.81	35.22	41.80	38.24	24.73	(1)	31.17	13	36.77
Erie, Pa	May 25, 1873	......	......	......	37.83	41.20	44.65	38.96	55.23	36.25	40.94	37.62	46.37	44.81	45.47	11	42.67
Cleveland, Ohio	Nov. 1, 1870	30.03	34.38	41.38	33.33	36.91	41.20	33.49	53.51	41.51	37.38	34.96	39.98	41.13	33.26	14	38.03
Sandusky, Ohio	Aug. 2, 1877	......	......	......	......	......	......	......	42.91	37.71	39.44	46.81	42.53	(1)	38.64	6	40.42
Toledo, Ohio	Nov. 1, 1870	31.42	27.56	35.52	25.83	28.03	34.55	35.17	32.67	30.27	35.72	45.91	33.03	34.24	28.43	14	32.74
Detroit, Mich.	Nov. 1, 1870	24.24	25.63	34.32	26.43	35.71	40.40	35.28	43.39	37.17	47.68	45.44	30.32	32.57	28.17	14	34.76
Upper Lakes:																
Alpena, Mich	Sept. 10, 1872	......	......	31.10	25.18	37.27	37.62	41.00	38.48	39.97	43.63	45.61	45.10	35.32	35.53	12	37.98
Escanaba, Mich	May 24, 1871	......	32.60	27.06	31.12	43.54	42.44	34.61	32.78	30.76	30.17	48.49	40.07	30.02	43.15	13	35.90
Grand Haven, Mich	May 24, 1871	......	32.50	28.14	(1)	(1)	46.29	36.03	33.75	35.48	44.65	47.89	42.16	44.84	46.62	11	39.85
Marquette, Mich	May 1, 1871	......	30.25	26.44	25.35	30.22	31.44	27.54	36.19	40.75	33.44	42.91	37.08	30.50	41.44	13	33.33
Port Huron, Mich	July 25, 1874	......	......	......	......	29.14	37.16	31.61	39.91	27.54	38.68	35.27	41.04	36.98	29.19	10	34.65
Chicago, Ill	Nov. 1, 1870	......	29.07	36.41	28.63	38.08	36.48	41.01	41.95	30.71	37.10	44.18	41.34	45.86	34.61	13	37.34
Milwaukee, Wis	Nov. 1, 1870	30.41	26.26	30.57	30.83	35.56	50.34	46.15	38.29	24.92	29.96	39.07	28.43	29.47	30.57	14	33.63
Duluth, Minn	Nov. 1, 1870	31.20	30.12	38.73	36.43	26.93	32.27	34.81	28.09	45.28	38.11	37.56	38.02	23.20	35.85	14	34.01
Upper Mississippi Valley:																
Saint Paul, Minn	Nov. 1, 1870	30.68	(1)	34.75	35.51	30.66	28.67	28.80	22.78	32.39	29.76	39.16	23.14	26.70	26.11	13	29.54
La Crosse, Wis	Oct. 15, 1872	......	......	28.27	31.88	38.72	39.41	36.58	31.40	34.94	34.34	44.74	27.93	38.69	35.81	12	34.85
Davenport, Iowa	May 24, 1871	......	36.44	28.08	36.79	31.99	46.83	35.10	31.21	33.89	42.73	37.28	36.60	34.59	38.11	13	36.13
Des Moines, Iowa	Aug. 1, 1878	......	......	......	......	......	......	......	......	32.82	36.66	56.81	47.60	39.69	41.14	6	42.45

[1] No record.

Annual and mean annual precipitation, at stations of the Signal Service, United States Army, compiled from the commencement of observations to 1884, *inclusive*—Continued.

Stations.	Established.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean annual.	
																Years.	Inches.
		Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*		
Upper Mississippi Valley—Continued:																	
Dubuque, Iowa	July 10, 1873	......	......	......	30.80	35.47	50.28	38.97	38.30	32.40	40.32	55.15	32.84	39.57	42.86	11	39.72
Keokuk, Iowa	July 16, 1871	......	29.37	41.04	35.77	48.42	51.65	48.59	31.80	22.51	34.54	39.01	41.54	38.63	32.88	13	38.13
Cairo, Ill	June 1, 1871	......	26.52	50.86	47.58	52.93	55.60	39.47	41.76	45.41	49.56	32.18	61.58	52.54	51.66	13	46.74
Springfield, Ill	July 1, 1879	......	......	......	......	......	......	......	......	......	30.93	56.51	58.21	48.79	43.18	5	47.52
Saint Louis, Mo	Nov. 1, 1870	22.61	30.40	45.03	37.88	42.99	47.74	41.26	40.83	25.70	34.56	37.37	43.15	40.10	40.64	14	37.88
Missouri Valley:																	
Leavenworth, Kans	May 21, 1871	......	43.50	35.27	33.81	31.26	44.48	52.06	35.15	41.55	36.89	39.95	25.97	41.94	44.72	13	38.07
Omaha, Nebr	Nov. 1, 1870	32.79	32.48	27.04	25.75	42.89	32.51	40.95	37.05	30.31	28.52	45.74	37.68	48.92	47.68	14	36.45
Bennett, Fort, Dak	Dec. 22, 1879	......	......	......	......	......	......	......	......	......	......	19.80	17.80	16.91	16.90	4	17.85
Huron, Dak	July 1, 1881	......	......	......	......	......	......	......	......	......	......	......	28.12	23.25	20.84	3	24.07
Yankton, Dak	April 1, 1873	......	......	......	23.93	37.15	28.84	28.31	28.73	22.73	21.68	40.95	20.63	35.21	22.16	11	28.21
Extreme Northwest:																	
Moorhead, Minn	Jan. 1, 1881	......	......	......	......	......	......	......	......	......	......	29.48	34.01	24.96	28.50	4	29.24
Saint Vincent, Minn	Sept. 5, 1880	......	......	......	......	......	......	......	......	......	......	15.51	22.48	17.88	21.81	4	19.42
Bismarck, Dak	Sept. 15, 1874	......	......	......	......	27.52	30.92	17.68	20.23	22.61	19.75	15.76	21.33	[illegible]	23.36	10	21.48
Buford, Fort, Dak	Oct. 23, 1878	......	......	......	......	......	......	......	......	19.71	23.25	13.90	12.73	10.82	7.87	6	14.63
Northern Slope:																	
Assinaboine, Fort, Mont	Oct. 6, 1879	......	......	......	......	......	......	......	......	......	......	......	12.76	15.10	25.67	3	17.84
Benton, Fort, Mont	Oct. 11, 1879	......	12.32	11.95	10.45	12.75	(1)	(1)	(1)	(1)	(1)	16.81	10.18	13.01	(1)	7	12.50
Custer, Fort, Mont	Dec. 5, 1878	......	......	......	......	......	......	......	......	......	19.65	11.88	12.05	13.84	16.60	5	14.80
Helena, Mont	Oct. 15, 1879	......	......	......	......	......	......	......	......	......	......	19.94	10.32	(1)	19.18	3	16.48
Maginnis, Fort, Mont	July 14, 1882	......	......	......	......	......	......	......	......	......	......	......	......	13.29	9.00	2	11.14
Poplar River, Mont	May 1, 1882	......	......	......	......	......	......	......	......	......	......	......	......	6.22	10.25	2	8.24
Shaw, Fort, Mont	April 1, 1880	......	......	......	......	......	......	......	......	......	......	14.77	14.21	12.64	13.64	4	13.82
Deadwood, Dak	Dec. 25, 1877	......	......	......	......	......	......	......	......	28.50	19.20	21.13	33.83	29.69	24.29	6	26.11
Cheyenne, Wyo	Nov. 1, 1870	9.23	13.48	10.01	9.71	12.10	5.03	11.71	12.64	7.34	8.38	11.88	8.64	19.24	15.54	14	11.07
North Platte, Nebr	Sept. 18, 1874	......	......	......	......	15.35	11.84	25.47	18.62	20.06	17.48	22.93	17.95	30.01	13.53	10	19.32
Middle Slope:																	
Denver, Colo	Nov. 19, 1871	......	18.05	11.81	13.46	17.25	20.12	16.38	15.51	10.86	9.58	12.78	14.49	19.49	15.07	13	14.90
Pike's Peak, Colo	Nov. 1, 1873	......	......	......	26.86	24.74	23.87	25.58	42.87	39.82	40.65	44.57	28.82	18.17	9.28	11	29.67
West Las Animas, Colo	Oct. 1, 1881	......	......	......	......	......	......	......	......	......	......	......	......	11.12	15.70	2	13.41
Dodge City, Kans	Sept. 15, 1874	......	......	......	......	10.78	15.40	27.89	17.96	15.48	18.12	33.55	13.14	28.50	30.36	10	21.11
Elliott, Fort, Tex	Nov. 29, 1879	......	......	......	......	......	......	......	......	......	16.79	16.16	24.76	28.21	33.91	5	23.97
Southern Slope:																	
Sill, Fort, Ind. T	June 23, 1875	......	......	......	......	......	......	48.45	33.69	25.07	33.75	28.22	31.18	(1)	(1)	6	33.88
Concho, Fort, Tex	Oct. 10, 1875	......	......	......	......	......	......	......	24.84	18.54	37.05	18.96	42.12	32.64	41.91	7	30.99
Davis, Fort, Tex	Dec. 24, 1877	......	......	......	......	......	......	......	......	21.41	23.48	(1)	20.22	14.22	22.56	5	20.38
Stockton, Fort, Tex	Feb. 26, 1876	......	......	......	......	......	......	......	12.47	5.12	33.40	12.65	25.56	27.80	24.07	7	20.09

Southern Plateau:																	
El Paso, Tex	Nov. 5, 1877									6.31	14.37	18.17	8.27	12.92	18.80	6	13.14
Apache, Fort, Ariz	Oct. 9, 1877									18.58	14.77	31.12	27.63	21.65	29.47	6	23.87
Grant, Fort, Ariz	Nov. 1, 1875								16.46	12.82	15.74	18.96	14.82	15.48	25.67	7	17.14
Prescott, Ariz	Nov. 19, 1878						16.16	(1)	15.63	12.89	10.02	15.45	15.26	16.18	26.75	8	16.04
Thomas, Camp, Ariz	Sept. 22, 1877											11.41	8.06	10.85	18.16	4	12.27
Yuma, Ariz	Nov. 18, 1878						0.94	3.66	2.88	3.29	0.74	0.98	1.78	(1)	5.86	8	2.52
Middle Plateau:																	
Salt Lake City, Utah	Mar. 19, 1874					23.64	21.28	16.35	19.75	13.11	10.94	16.88	15.98	14.24	17.52	10	16.97
Northern Plateau:																	
Boisé City, Idaho	July 1, 1877								10.21	17.68	10.66	13.56	14.43	(1)	21.05	6	14.59
Lewiston, Idaho	July 1, 1879										17.41	20.56	14.74	15.83	21.71	5	18.05
Dayton, Wash	July 1, 1879										29.78	27.70	33.52	21.44	26.43	5	27.77
Spokane Falls, Wash	Feb. 5, 1881												25.99	14.87	20.56	3	20.81
North Pacific Coast:																	
Olympia, Wash	July 1, 1877								63.34	73.44	62.77	65.56	51.59	41.61	35.58	7	56.27
Portland, Oreg	Nov. 1, 1871		46.90	50.52	46.17	60.08	55.04	58.30	47.70	62.22	51.87	58.05	67.24	51.45	38.41	13	53.38
Roseburg, Oreg	July 15, 1877								36.92	45.03	31.44	43.68	34.77	22.48	(1)	6	35.72
Middle Pacific Coast:																	
Cape Mendocino, Cal	July 27, 1882													19.17	16.81	2	17.99
Red Bluff, Cal	July 1, 1877								48.96	33.64	26.53	24.93	21.82	13.76	28.06	7	28.24
Sacramento, Cal	July 1, 1877								23.45	22.37	31.99	20.71	18.06	13.48	34.92	7	23.57
San Francisco, Cal	Mar. 8, 1871		22.45	18.55	22.52	22.63	23.54	11.93	33.26	30.76	30.07	23.73	18.67	15.43	38.82	13	24.03
South Pacific Coast:																	
Los Angeles, Cal	July 1, 1877								20.86	17.41	18.65	5.53	10.74	14.14	40.39	7	18.25
San Diego, Cal	Nov. 1, 1871		6.04	13.01	10.91	6.80	7.24	8.12	13.87	14.71	10.37	5.00	9.74	8.01	27.59	13	10.88
Alaska Stations:																	
Atka, Alaska	Oct. —, 1881												85.11	83.97	97.46	3	88.85
Saint Michael's, Fort, Alaska	June 28, 1874							9.37	16.18	7.26	(1)	16.61	8.20	21.73	15.50	7	13.55
Sitka, Alaska	Mar. 30, 1881												102.24	102.37	110.94	3	105.18
Unalashka, Alaska	Aug. 18, 1878												80.80	90.12	158.29	3	109.74
Behring's Island, Behring Sea	June —, 1882													23.92	20.11	2	22.02

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[1] No record.

APPENDIX 31.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Accotink, Va	4.58	5.70	5.77	1.86	8.25	5.58	8.18	0.97	(2)	1.42	2.61	3.83	43.69
Aiken, S. C	2.58	3.08	7.16	4.40	8.13	(1)	(1)	(1)	(1)	(1)	1.91	6.02	......
Ainsworth, Wash	(1)	(1)	(1)	0.67	0.07	0.90	0.23	0.85	0.67	0.56	(1)	(1)	......
Albany, Oreg	8.91	8.90	8.12	4.80	0.89	8.38	1.87	0.48	5.61	2.85	2.18	7.83	45.22
Albion, Idaho	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.00	1.90	0.60	7.82	......
Allison, Kans	0.22	0.68	2.81	1.90	9.04	2.34	6.64	8.14	0.65	1.50	0.18	0.80	29.85
Amherst, Mass	8.60	4.62	5.67	2.48	2.02	1.88	8.75	5.10	1.25	2.40	2.53	5.58	40.38
Andersonville, Ga	(1)	8.18	7.52	4.17	1.27	(1)	8.78	4.10	(2)	(2)	(1)	(1)	......
Anna, Ill	2.01	5.88	4.05	8.80	4.99	7.44	5.49	2.65	8.83	1.42	2.58	9.57	52.71
Ann Arbor, Mich	1.07	(1)	(1)	1.05	(1)	(1)	(1)	(1)	2.91	(1)	1.84	(1)	......
Antrim, N. H	(1)	(1)	(1)	4.70	2.95	1.80	2.95	2.75	2.70	2.55	8.85	5.10	......
Archer, Fla	5.48	2.14	5.83	2.45	4.72	11.66	8.83	5.85	1.95	0.29	8.80	3.75	55.70
Ardenia (Phillipstown), N. Y.	(1)	(1)	(1)	(1)	2.48	1.91	8.88	8.07	2.22	(1)	(1)	(1)	......
Ashland, N. H	5.65	5.29	5.64	2.89	(1)	8.06	8.62	4.85	1.07	2.79	8.76	5.10	......
Asheville, N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.10	2.90	......
Ashwood, Tenn	6.80	7.30	6.10	6.00	8.90	8.80	7.00	1.70	0.60	2.40	1.70	8.70	51.00
Atchison, Kans	(1)	0.81	2.75	5.47	2.60	5.75	5.50	4.20	5.90	2.90	1.80	0.90	......
Athens, Ga	(1)	(1)	(1)	6.07	0.82	10.46	5.70	2.62	0.01	0.51	8.76	5.97	......
Auburn, N. Y	2.96	1.88	1.71	0.80	8.67	1.68	2.78	2.77	8.55	3.38	2.05	2.41	29.14
Austin, Tenn	5.95	8.27	8.25	2.10	8.47	(1)	4.08	2.29	1.51	2.71	1.77	3.34	......
Austin, Tex	(1)	(1)	4.45	7.78	7.85	1.46	(1)	0.04	1.76	2.63	8.40	1.68	......
Bainbridge Island, Wash	4.40	3.53	0.97	2.50	0.55	2.70	0.10	1.35	2.48	6.20	2.55	(1)	......
Bandon, Oreg	(1)	(1)	(1)	3.96	0.53	1.22	1.06	(1)	5.13	8.12	3.93	18.65	......
Belmont, N. H	4.09	4.41	4.87	4.10	(1)	1.43	2.27	4.25	0.72	2.52	4.01	4.22	......
Beloit, Wis	0.64	(1)	1.52	2.85	2.62	5.15	4.27	2.94	2.22	3.96	1.72	4.34	......
Belvidere, N. J	4.49	4.78	(1)	2.36	(1)	(1)	6.12	5.90	1.21	2.95	(1)	(1)	......
Bethel, Conn	4.55	5.10	3.30	1.90	8.05	3.90	7.16	6.20	1.07	3.26	8.95	6.52	49.96
Blacksburg, Va	(1)	(1)	(1)	(1)	(1)	(1)	8.09	2.85	1.00	0.84	1.00	2.19	......
Blooming Grove, Pa	2.20	2.81	(1)	1.40	8.30	8.50	8.50	4.70	(1)	(1)	8.00	3.40	......
Blue Lake, Cal	(1)	(1)	(1)	(1)	(1)	1.56	0.24	0.01	3.23	2.17	1.37	2.64	......
Bowling Green, Ky	4.60	6.89	5.12	(1)	(1)	(1)	3.97	(1)	(1)	(1)	1.99	(1)	......
Brevard, N. C	6.72	10.07	14.58	5.02	2.21	12.94	(1)	2.57	0.70	0.79	4.05	10.25	......
Bristol, N. H	4.41	5.67	3.08	2.87	3.59	2.10	2.84	6.50	0.52	2.32	2.98	5.05	41.43
Bunker Hill, Ill	1.51	4.11	3.79	2.33	4.27	3.96	2.30	2.56	7.19	2.33	1.86	5.80	42.01
Burlington, Vt	2.14	2.68	2.89	1.92	3.60	1.86	(1)	(1)	2.22	3.82	2.95	2.60	......
Cahuenga, Cal	(1)	(1)	(1)	(1)	0.69	0.81	0.00	(2)	(1)	0.51	1.17	3.86	......
Caldwell, N. J	5.54	6.51	4.65	3.20	4.56	5.60	6.62	6.50	(1)	(1)	(1)	(1)	......
Carson City, Nev	2.46	2,77	3.23	1.29	0.29	1.97	0.00	0.62	0.22	0.22	0.00	4.75	17.82
Catawissa, Pa	3.17	3.61	4.08	2.92	3.38	3.63	2.83	2.27	2.66	3.69	2.98	3.77	38.99
Cath Soph, S. A	(1)	(1)	(1)	(1)	9.10	5.84	3.62	2.89	1.16	2.94	0.00	(1)	......
Cedar Rapids (W), Iowa	0.71	1.41	2.47	2.12	3.08	3.38	(1)	(1)	(1)	(1)	1.37	3.54	......
Chambersburg, Pa	3.23	4.43	4.90	1.22	4.42	5.22	5.20	2.22	0.89	2.27	1.51	4.83	40.34
Chapel Hill, N. C	4.95	2.58	6.20	2.68	4.97	3 89	6.63	4.64	0.52	0.83	(1)	6.98	......
Charlotte, Vt	3.60	4.90	4.25	2.90	4.40	2.20	5.00	2.90	3.00	4.10	4.00	4.50	45.75
Chester, Minn	(1)	(1)	0.48	2.83	2.88	4.73	3.38	7.79	6.20	3.47	0.65	0.95	......
Cincinnati (G. W. H.), Ohio	1.59	6.45	2.24	2.34	4.97	2.38	0.26	(1)	8.72	1.25	1.08	3.36	......
Clarksville, Tex	2.49	10.38	2.98	(1)	9.53	5.77	0.12	4.65	1.08	1.78	2.60	7.48	......
Clay Centre, Kans	0.71	1.11	(1)	(1)	(1)	3.23	3.98	5.68	6.02	2.24	1.28	1.12	......
Cleburne, Tex	0.88	4.12	6.25	3.64	5.03	10.09	0.32	0.62	1.00	2.01	3.00	4.01	40.97
Cleveland, Ohio	2.48	5.01	2.42	1.91	3.00	2.06	4.01	1.90	3.77	1.87	2.02	2.82	33.27
Clinton, Ind	(1)	(1)	(1)	(1)	4.30	10.64	7.91	0.75	(1)	(1)	(1)	(1)	......
Cockburn Harbor, B. W. I	(1)	(1)	(1)	0.26	(1)	(1)	(1)	(1)	(1)	7.15	0.90	2.36	......
College City, Cal	3.61	2.21	5.46	2.48	0.17	2.04	0.00	(1)	0.36	0.29	0.69	5.14	......
College Hill, Ohio	3.50	5.00	2.00	2.25	4.75	2.00	1.70	0.70	4.88	2.70	0.50	4.12	33.60
Collinsville, Ill	0.82	4.46	2.88	3.44	4.21	3.73	2.21	1.82	3.66	1.64	2.16	5.68	36.71
Conception, Mo	0.75	0.43	2.41	2.44	3.84	3.02	6.12	2.02	4.07	2.92	0.94	1.46	30.42
Contoocook, N. H	4.15	5.00	4.20	(1)	2.35	1.05	2.00	2.00	(1)	1.75	(1)	4.50	......
Cooperstown, N. Y	3.17	3.16	4.48	1.20	3.97	2.16	3.01	2.46	1.29	3.81	2.86	4.00	35.07
Cornish, Me	2.74	7.28	5.31	(1)	4.38	1.88	5.27	4.53	1.39	3.56	3.00	5.92	......
Cresco, Iowa	0.38	1.51	1.64	2.71	2.44	4.47	4.23	3.34	3.18	2.83	0.66	2.30	34.69
Crete, Nebr	0.41	0.41	1.20	3.02	1.79	1.39	5.94	3.18	1.46	3.80	0.02	0.19	22.81
Cumberland, Md	1.85	3.64	5.14	1.96	5.33	3.33	4.61	1.49	0.93	1.98	0.92	4.25	35.43
Dale Enterprise, Va	(1)	(1)	(1)	(1)	(1)	(1)	1.97	5.65	1.32	0.91	2.86	5.04	......

[1] No record.

[2] Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
De Soto, Nebr	0.65	1.23	3.20	2.89	1.81	3.99	7.87	5.95	8.11	4.52	0.12	1.20	41.04
Distributing Reservoir, D. C	5.28	7.19	7.00	2.87	1.90	6.20	8.03	0.88	0.22	1.62	3.23	4.63	48.50
Dorset, Vt	2.61	5.17	4.93	2.49	3.96	2.66	2.52	4.89	0.85	4.69	4.73	4.63	44.13
Drifton, Pa	4.30	(1)	4.04	4.36	3.62	2.88	6.77	4.79	2.50	2.67	3.83	4.76	......
Dudley, Mass	(1)	(1)	(1)	(1)	2.93	(1)	(1)	3.24	1.06	1.03	2.14	(1)	......
Dyberry, Pa	3.75	5.59	3.93	3.00	3.86	1.27	6.02	3.43	2.53	2.84	2.48	3.74	41.94
East Harbor, B. W. I	1.56	1.04	(1)	(1)	5.91	4.53	(1)	2.76	(1)	(1)	(1)	(1)	......
Easton, Pa	4.73	4.77	4.97	2.88	2.28	2.87	5.19	5.91	1.01	3.96	3.26	6.07	47 40
East Portland, Oreg	(1)	(1)	(1)	2.16	0.09	0.12	2.04	0.03	3.08	3.14	(1)	2.97	......
Elk Falls, Kans	2.50	1.50	(1)	4.00	4.00	2.00	7.50	6.00	6.00	3.00	2.60	4.02	......
Embarrass, Wis	(1)	(1)	1.75	3.40	3.75	3.35	6.25	7.70	9.40	7.85	2.60	5.51	......
Emmittsburg, Md	(1)	(1)	(1)	2.14	7.19	0.40	(1)	(1)	0.82	1.55	3.08	4.00	......
Emporia, Kans	(1)	1.16	(1)	4.33	2.49	4.34	4.71	4.48	3.15	1.72	1.93	1.81	......
Eola, Oreg	3.46	5.54	2.49	3.09	0.42	1.67	2.29	0.17	6.59	2.80	2.88	6.09	37.44
Factoryville, N. Y	2.42	2.07	4.87	1.49	3.54	1.24	2.63	2.07	1.74	2.86	1.41	2.73	28.57
Fall Brook, Cal	3.56	15.39	10.90	(1)	(1)	(1)	(1)	(1)	(1)	0.58	0.54	7.15	......
Fall River, Mass	6.25	6.15	5.68	3.71	4.25	4.05	5.19	6.33	0.83	2.17	3.56	6 94	55.06
Fallsington, Pa	4.90	5.04	4.79	2.25	4.48	5.30	4.24	4.58	0.22	2.80	3.12	6.00	47.22
Fallston, Md	4.16	7.01	5.71	1.94	3.86	5.00	3.57	3.00	0.23	1.48	3.14	6.06	45.16
Fayetteville, Ark	2.70	8.05	3.82	5.03	4.14	4.77	5.48	3.77	4.92	2.17	(1)	(1)	......
Flat Rock, N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.51	3.11	0 53	0.05	(1)	......
Forsyth, Ga	3.97	4.87	11.93	4.93	1.72	6.73	(1)	4.20	1.60	0.10	3.86	4.73	......
Fort Collins, Colo	(1)	(1)	1.15	3.92	4.84	(1)	1.25	(1)	(1)	0.10	0.15	0.35	......
Fort Madison, Iowa	0.60	1.50	4.70	2.00	4.95	4.23	1.41	6.87	3.87	5.40	1.90	3.16	40.59
Fort Scott, Kans	1.45	2.83	2.44	7.53	9.08	3.83	10.76	4.71	11.45	2.33	(1)	4.00	......
Fort Wayne, Ind	2.50	4.01	2.73	1.51	4.02	2.05	5.63	0.95	2.25	3.40	1.50	4.95	35.50
Frankfort, Ky	5.05	8.56	(1)	3.32	5.19	2.80	(1)	1.66	6.07	1.64	(1)	4.16	......
Franklin, Pa	5.20	4.35	3.66	1.47	2.39	5.54	4.85	3.33	2.64	3.08	1.77	3.72	42.00
Franklin, Wis	(1)	(1)	(1)	6.30	3.45	2.63	(1)	3.48	1.37	4.24	(1)	2.25	......
Fremont, Nebr	1.60	1.19	2.76	3.20	1.40	3.29	9.08	(1)	5.81	2.72	0.21	2.01	......
Gardiner, Me	5.40	7.29	5.40	0.53	4.00	1.22	5.17	4.22	2.11	3.14	3.29	5.05	52.82
Garrettsville, Ohio	5.45	(1)	4.17	1.53	1.79	1.49	5.30	1.62	3.70	2.56	1.63	2.99	......
Genoa, Nebr	0.70	1.20	2.75	8.05	4.20	2.47	7.30	3.85	3.02	2.80	0.05	1.65	33.04
Germantown, Pa	(1)	(1)	4.18	2.02	3.25	4.57	4.88	4.02	0.14	2.22	(1)	3.79	......
Grampian Hills, Pa	3.29	4.69	5.10	3.00	2.86	9.85	5.29	4.07	2.14	3.76	1.82	3.65	49.52
Grand Coteau, La	9.88	2.50	10.20	5.62	14.03	2.50	2.84	1.75	0.75	3.81	3.57	14.43	71.88
Grand Junction, Colo	(1)	(1)	(1)	1.74	(1)	(1)	(1)	1.62	0.18	(1)	(1)	(1)	......
Grand Turk Island, B. W. I	1.10	0.80	1.37	0.04	2.33	2.24	(1)	1.87	(1)	8.21	3.38	1.86	......
Great Falls Reservoir, Md	5.10	5.75	5.84	1.98	3.19	5.80	4.50	1.73	(1)	1.73	3.41	4.16	......
Green Springs, Ala	7.67	6.48	9.17	5.19	1.18	7.57	12.02	1.64	1.25	2.41	2.02	5.39	61.39
Guttenberg, Iowa	0.76	1.79	1.87	1.60	2.84	4.18	2.95	4.51	3.50	2.78	0.66	2.60	30.04
Hartford, Conn	(1)	(1)	(1)	(1)	3.36	1.73	5.98	2.87	0.79	2.88	2.78	6.09	......
Haverford College, Pa	(1)	5.88	4.92	2.47	3.33	5.72	5.10	3.24	0.20	2.24	3.48	5.32	......
Helvetia, W. Va	6.00	5.24	4.96	2.70	4.51	5.69	5.12	4.30	0.92	2.45	2.66	4.30	48.85
Highlands, N. C	3.60	10.10	13.55	5.40	2.45	8.35	3.37	4.03	1.40	1.42	4.54	11.94	70.15
Hillsdale, Mich	1.11	4.36	2.48	1.70	4.13	5.39	1.06	0.62	2.64	3.48	2.41	4.14	33.52
Hiram, Ohio	5.14	(1)	5.28	1.92	(1)	1.64	4.12	1.63	4.25	2.88	2.17	3.49	......
Holton, Kans	1.12	0.37	4.75	(1)	(1)	(1)	(1)	(1)	(1)	3.12	1.40	1.30	......
Hudson, Mich	2.36	3.42	(1)	(1)	4.58	3.61	1.39	1.29	1.72	3.68	1.68	2.33	......
Hulmeville, Pa	3.15	5.60	(1)	(1)	1.80	4.87	3.55	2.69	(1)	(1)	(1)	(1)	......
Humboldt, Iowa	0.20	1.19	3.04	3.27	2.62	3.47	3.49	4.27	5.66	3.96	0.69	2.50	34.36
Humphrey, N. Y	2.14	3.62	8.50	2.14	5.11	14.15	5.27	4.80	4.82	3.93	2.93	3.69	56.10
Hydesville, Cal	4.43	4.30	7.03	6.28	0.50	0.63	0.05	0.07	1.02	0.98	0.69	(1)	......
Independence, Iowa	1.35	1.70	3.15	1.68	3.70	4.55	6.60	4.[illegible]	10.00	2.10	1.10	2.04	43.62
Independence, Kans	0.68	2.23	1.00	4.85	1.27	2.52	5.77	5.83	9.71	4.22	2.58	3.34	44.00
Indianola, Iowa	0.38	1.98	2.50	1.83	3.56	3.80	11.51	2.81	3.94	4.43	1.19	2.29	40.22
Ionia, Mich	2.24	3.37	3.51	2.16	2.81	2.93	3.02	0.55	3.26	4.30	1.91	5.25	35.31
Ithaca, N. Y	3.13	2.64	3.41	1.88	4.36	1.35	4.87	3.75	1.72	2.90	1.74	2.42	34.17
Jacksonburg, Ohio	2.60	7.65	3.10	2.55	5.40	1.65	1.70	1.20	(1)	1.15	0.85	3.40	......
Jeffersonville, Ind	(1)	8.81	3.60	2.30	4.94	4.06	3.54	3.36	5.27	1.81	1.65	4.72	......
Johanna Maria, S. A	(1)	(1)	(1)	(1)	5.68	10.68	1.77	1.45	1.00	0.45	0.00	(1)	......
Johnsontown, Va	6.65	6.55	8.75	1.70	(1)	1.05	4.05	2.10	(2)	(2)	0.90	4.90	......
Kalamazoo, Mich	(1)	4.32	(1)	2.11	3.96	4.86	2.59	1.82	2.39	2.88	1.81	7.14	......
Kelley's (near Raleigh), N. C	(1)	(1)	(1)	(1)	(1)	(1)	(1)	7.25	7.80	(1)	3.10	9.40	......
Kennewick, Wash	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.44	0.86	......
Kew, B. W. I	(1)	(1)	(1)	0.78	12.06	7.64	(1)	3.26	(1)	12.14	2.36	4.65	......
Klamath Agency, Oreg	(1)	(1)	(1)	(1)	(1)	(1)	0.24	0.02	(1)	(1)	(1)	10.58	......
Laconia, Ind	3.19	9.19	5.05	2.46	4.07	4.73	3.42	4.12	5.13	2.00	1.04	4.48	48.88
Lafayette, Ind	1.09	5.08	1.87	2.79	3.31	4.12	5.81	1.12	2.43	2.54	1.41	6.27	37.87
Lake Village, N. H	4.16	5.92	5.81	3.40	(1)	1.88	4.32	3.32	0.83	2.18	3.52	4.12	......
Lancaster, Wis	(1)	(1)	2.02	2.22	3.39	4.82	5.38	5.65	4.53	3.35	0.72	4.02	
Lansing, Mich	1.92	3.24	3.71	2.12	4.34	3.09	3.24	1.34	2.71	6.91	1.60	2.77	36.99
Lawrence, Kans	1.28	1.13	2.78	5.62	3.57	3.81	(1)	(1)	(1)	2.38	0.80	2.50	.....
Lead Hill, Ark	2.05	10.93	3.95	3.89	5.93	3.57	5.04	4.78	5.14	0.94	4.71	11.37	62.30

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[2] Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Leetsdale, Pa	5.33	5.11	3.97	1.28	2.88	5.29	7.01	2.07	1.99	2.22	1.43	4.84	43.42
Lenoir, N. C	3.80	4.90	9.40	4.50	2.40	10.30	1.70	3.30	0.60	0.70	1.00	8.10	50.70
Le Roy, N. Y	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.07	2.22	1.77	1.92	2.18	..
Limona, Fla	0.38	0.71	2.15	3.20	3.43	9.45	4.75	8.28	3.75	0.90	1.45	0.80	39.31
Lincolnton, N. C	(1)	(1)	(1)	(1)	(1)	4.47	2.51	1.51	0.17	0.99	2.61	9.32	......
Logan, Iowa	1.30	1.50	1.70	3.10	2.10	3.40	7.40	5.00	5.50	4.40	0.10	1.10	36.60
Logansport, Ind	1.80	4.43	1.50	2.19	3.42	4.25	3.17	1.83	2.29	3.26	1.82	5.82	35.78
Luling, La	(1)	(1)	(1)	(1)	(1)	(1)	3.60	0.86	3.84	(1)	(1)	(1)	......
Lunenburg, Vt	3.20	2.30	1.50	0.86	4.25	1.95	2.50	2.40	2.65	5.00	1.90	2.80	31.31
Madison, Nebr	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.35	(1)	(1)	0.06	......
Madison, Wis	(1)	(1)	2.31	4.51	4.21	5.47	8.44	4.39	4.25	4.60	1.53	5.68	......
Manatee, Fla	(1)	(1)	(1)	(1)	(1)	(1)	(1)	3.73	6.03	3.66	1.46	2.00	......
Manchester, Iowa	(1)	1.33	1.99	2.81	2.67	3.99	3.78	2.42	7.25	2.48	1.12	2.57	......
Manhattan, Kans	(1)	0.52	2.68	3.45	5.13	(1)	6.33	5.02	5.64	2.48	(1)	(1)	......
Manistique, Mich	0.94	4.47	0.84	2.32	1.76	0.97	3.47	4.50	6.63	6.83	2.65	5.05	40.43
Manitowoc, Wis	(1)	(1)	1.59	4.30	2.43	5.16	5.44	4.81	1.55	5.03	(1)	5.36	......
Margaretta Township, Ohio	1.18	4.67	2.99	1.48	3.46	2.15	5.62	1.71	3.38	1.06	0.72	2.85	31.27
Marion, Va	4.42	5.82	6.70	3.37	2.04	3.97	1.22	3.27	0.03	1.10	0.44	4.60	36.98
Marquette, Nebr	7.75	5.37	4.68	3.13	5.36	1.58	8.25	1.70	1.79	2.17	(1)	0.60	......
Marshall, Mich	2.80	3.90	(1)	0.51	3.83	4.72	3.73	1.08	1.48	3.67	(1)	(1)	......
Mattoon, Ill	0.90	5.44	2.75	4.16	5.00	6.87	3.65	2.20	4.70	2.80	1.83	5.45	45.75
Maud, Kans	(1)	(1)	(1)	2.45	(1)	5.87	1.77	3.63	0.19	0.78	2.06	0.80	.
Mayport, Fla	3.53	3.62	3.06	1.88	4.41	7.23	5.68	6.32	5.55	3.51	3.78	2.95	51.52
Mazatlan, Mex	3.88	(1)	(1)	(2)	1.50	2.01	9.26	5.69	16.50	3.58	0.51	2.05	......
McDonogh, Md	(1)	6.04	5.24	1.38	3.18	2.95	5.44	2.11	0.18	1.64	3.86	3.81	......
Menand Station (near Albany), N. Y	0.95	1.75	4.83	1.67	2.89	1.96	3.95	6.16	1.57	3.00	3.36	3.13	35.22
Mendon, Mass	(1)	(1)	(1)	(1)	(1)	2.80	(1)	(1)	(1)	(1)	1.10	(1)	......
Mendon, Mich	(1)	(1)	(1)	1.97	5.39	2.19	3.38	1.87	2.07	(1)	(1)	(1)	......
Milan, Tenn	4.45	7.96	4.49	5.55	4.98	3.84	8.51	1.58	4.95	2.82	1.61	7.25	57.99
Milledgeville, Ga	(1)	(1)	3.88	4.51	1.69	7.64	2.52	3.38	0.00	0.69	1.54	5.87	......
Milton, Mass	5.72	5.46	4.70	4.21	3.01	4.22	3.75	4.20	0.65	2.98	3.43	4.27	46.60
Minneapolis, Minn	0.73	0.22	0.95	1.73	2.99	4.18	(1)	3.91	5.27	3.08	0.66	2.31	.
Monticello, Iowa	0.61	1.15	3.90	1.86	3.74	2.82	3.99	3.78	6.80	3.19	1.59	4.34	37.77
Moorestown, N. J	4.36	5.33	4.64	1.65	3.29	3.52	3.78	5.08	0.16	2.29	3.40	5.37	42.87
Mottville, Mich	1.12	3.34	3.58	1.58	27.16	(1)	2.00	0.70	(1)	(1)	1.99	(1)	......
Mountainville, N. Y	5.84	4.49	3.96	2.45	(1)	3.73	7.72	3.42	0.98	3.38	4.14	5.23	......
Mount Forest, Canada	(1)	(1)	(1)	0.94	(1)	4.88	7.18	(1)	2.73	(1)	(1)	(1)	......
Mount Ida, Ark	2.80	9.80	4.90	8.30	10.25	2.25	5.80	1.05	2.65	0.70	2.55	15.95	66.00
Muscatine, Iowa	1.05	1.40	4.28	2.08	5.57	4.03	3.63	5.77	5.23	6.46	1.57	4.42	45.49
Nayatt Point, R. I	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.65	4.60	7.68	7.03	......
Neillsville, Wis	(1)	(1)	0.79	1.80	3.30	3.41	6.05	6.32	6.80	4.00	0.26	2.31	......
Nephi, Utah	0.86	3.70	2.15	6.30	2.70	0.50	0.25	0.35	1.70	2.05	0.00	5.40	25.96
New Athens, Ohio	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.39	2.46	2.39	1.37	4.42	......
New Bedford, Mass	4.70	5.67	(1)	(1)	3.37	(1)	0.48	3.41	0.96	1.61	3.49	5.97	......
Newport, Vt	3.55	4.03	3.61	2.56	6.79	4.33	3.71	3.45	3.32	5.88	4.16	3.21	48.60
New Tacoma, Wash	4.93	(1)	1.27	(1)	(1)	2.81	1.80	1.29	3.21	(1)	1.84	4.88	......
New Ulm, Tex	3.43	2.58	4.86	4.68	15.25	2.82	0.00	0.21	5.18	1.78	4.99	(1)	......
North Colebrook, Conn	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2.50	3.99	5.30	......
Northfield, Minn	0.75	1.82	1.17	2.02	2.56	5.16	2.69	3.48	5.51	3.45	0.60	2.33	31.54
North Lewisburg, Ohio	1.90	4.55	3.10	1.75	2.05	1.90	4.35	0.80	7.60	1.05	0.85	4.40	34.30
Northport, Mich	4.00	2.15	4.58	16.50	19.85	5.60	10.75	3.25	1.75	1.24	7.00	2.00	78.67
North Volney, N. Y	3.70	3.25	3.90	0.80	(1)	1.15	2.50	3.20	2.20	3.00	2.40	3.50	......
Oakland, Cal	3.81	5.25	3.59	5.79	0.55	3.03	(2)	0.25	0.35	2.80	0.05	7.73	33.20
Orono, Me	4.44	6.85	4.37	3.38	5.42	1.37	2.38	3.12	2.19	2.70	3.99	4.74	44.95
Ottumwa, Iowa	(1)	1.11	3.45	3.51	4.00	4.91	5.44	4.92	2.89	5.54	1.21	3.12	......
Palermo, N. Y	5.05	3.60	3.23	0.68	1.48	1.27	1.69	2.19	1.91	2.65	2.18	3.42	29.35
Paramaribo (Dutch Guiana), S. A	6.50	(1)	(1)	(1)	18.33	8.45	8.16	1.74	2.20	0.29	1.27	2.97	......
Paterson, N. J	5.16	5.74	3.20	2.40	4.47	(1)	6.46	(1)	0.58	(1)	(1)	(1)	......
Penn Yan, N. Y	3.28	2.15	2.68	1.33	2.73	2.32	3.69	2.13	1.82	1.52	1.09	1.99	26.73
Peoria, Ill	0.70	3.18	2.17	2.62	5.50	3.87	3.67	4.18	5.76	4.80	2.19	3.21	41.85
Phillipsburg, N. J	3.88	4.38	3.47	2.07	(1)	3.78	4.91	3.40	0.41	1.58	2.72	4.59	......
Pierce City, Mo	0.90	4.70	1.30	5.60	4.10	4.20	5.10	3.70	7.30	(1)	(1)	(1)	......
Plant Waterloo, S. A	(1)	(1)	(1)	(1)	(1)	9.85	6.88	4.50	1.02	0.00	0.00	(1)	......
Pleasant Grove, Wash	(1)	(1)	0.62	1.26	0.17	0.47	1.16	(2)	0.33	0.71	0.16	2.07	......
Point Pleasant, La	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.00	0.14	0.44	7.99	20.39	......
Port Jervis, N. Y	3.62	4.29	4.45	3.29	3.75	2.12	5.56	5.18	1.15	2.29	3.39	4.23	43.32
Portsmouth, Ohio	5.34	6.11	5.55	3.90	4.89	3.47	2.45	1.85	1.87	1.22	1.46	4.70	42.81
Poway, Cal	1.59	(1)	6.96	4.81	2.26	0.44	(1)	(2)	(2)	0.24	0.88	5.91	......
Prairie du Chien, Wis	(1)	(1)	(1)	(1)	2.42	3.10	4.19	5.91	5.41	2.80	1.70	2.79	......
Princeton, Cal	4.03	2.35	5.06	2.71	0.65	2.12	0.00	(1)	1.18	1.10	(1)	6.03	......
Princeton, Mass	7.56	7.44	6.91	5.75	3.29	3.45	4.57	5.78	1.59	2.99	5.29	9.59	64.21
Providence, R. I	(1)	(1)	(1)	4.25	2.94	4.31	(1)	(1)	1.41	2.73	3.50	6.59	......

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	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Pueblo, Colo	0.57	0.72	0.05	3.53	1.60	2.85	0.72	2.85	0.40	(2)	0.05	0.78	18.62
Puerto de Luna, N. Mex	(1)	(1)	0.05	(1)	1.20	1.07	2.10	5.63	(1)	1.04	(1)	0.28	......
Quakertown, Pa	2.96	4.74	4.99	2.70	3.53	6.54	7.92	3.76	(1)	(1)	3.53	6.46	......
Quitman, Ga	6.00	(1)	5.05	(1)	(1)	(1)	(1)	(1)	(1)	0.40	2.00	6.60	......
Raleigh, N. C	5.70	(1)	(1)	(1)	1.20	(1)	(1)	3.60	7.00	0.50	(1)	4.50	......
Readington, N. J	(1)	(1)	(1)	(1)	3.40	3.80	5.80	3.90	0.40	3.40	4.30	7.00	......
Receiving Reservoir, D. C	5.60	6.82	6.69	2.67	2.70	3.12	5.99	0.89	0.24	(1)	3.36	5.08	......
Red Willow, Nebr	0.33	(1)	1.10	1.47	5.84	2.28	7.04	5.24	0.12	0.78	0.20	1.17	......
Richardton, Dak	(1)	0.90	1.00	4.02	1.40	6.00	5.20	6.40	2.50	0.70	0.70	1.50	......
Richmond, Ky	(1)	(1)	(1)	3.63	2.43	3.21	6.35	1.74	3.90	2.29	1.58	2.76	......
Riley, Ill	0.80	2.20	1.51	2.85	2.56	4.22	4.19	3.36	4.34	3.85	1.79	3.28	34.95
Ripon, Wis	(1)	(1)	2.15	2.26	0.75	2.93	5.90	(1)	(1)	(1)	(1)	(1)	......
Rockford, Ill	1.42	1.91	2.88	3.45	3.43	6.16	6.13	3.68	3.85	6.21	1.90	6.51	47.65
Rowe, Mass	3.27	5.10	4.65	1.85	3.15	1.60	5.10	3.22	0.95	3.02	3.70	5.03	40.04
Ruggles, Ohio	2.20	3.75	(1)	0.85	2.60	1.45	2.30	1.00	3.80	1.45	0.85	2.15	......
Sacramento, Cal	3.18	4.10	7.63	4.30	0.09	1.57	0.00	0.01	0.57	1.85	(2)	8.89	32.19
Salem, N. J	(1)	(1)	(1)	3.06	1.32	2.49	2.20	2.47	0.74	1.34	3.15	(1)	......
Salina, Kans	0.02	0.05	1.09	2.09	2.07	5.09	5.00	3.09	1.04	0.09	0.08	0.06	19.77
Salinas City, Cal	1.70	4.49	5.09	3.05	0.72	2.66	0.00	0.18	0.11	1.79	(1)	4.46	......
Salt Cay, B. W. I	0.83	0.52	(1)	0.24	1.01	1.23	(1)	1.17	(1)	12.27	3.64	3.75	......
Sandwich, Ill	(1)	3.48	2.08	(1)	2.10	3.24	7.06	1.93	2.52	4.95	1.46	5.23	......
San Rafael, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.09	0.28	3.03	0.17	20.96	......
Sherlock, Kans	(1)	(1)	0.45	0.38	7.94	3.79	5.31	3.20	1.09	1.40	0.24	1.38	......
Snowville, Va	(1)	(1)	(1)	(1)	2.20	7.80	3.90	0.24	(1)	(1)	(1)	(1)	......
Somerset, Mass	6.00	4.12	4.91	4.83	2.93	3.56	4.65	4.03	0.94	2.10	3.40	5.67	47.14
Somerville, N. J	4.68	4.68	3.73	2.12	2.88	6.20	4.44	2.44	0.26	2.92	5.85	5.78	45.98
Southington, Conn	4.18	4.76	3.49	3.05	2.46	2.06	4.08	4.18	0.53	2.85	2.35	6.45	40.44
South Orange, N. J	6.00	4.85	4.28	2.85	3.30	6.02	5.05	7.23	0.15	2.90	3.80	5.40	50.83
Spiceland, Ind	(1)	(1)	(1)	(1)	4.23	2.11	2.08	0.40	4.25	1.81	1.31	6.47	......
Springfield, Ark	4.15	10.15	(1)	4.39	(1)	1.14	1.67	0.42	(1)	(1)	(1)	(1)	......
Springfield, Mo	(1)	(1)	(1)	(1)	5.48	2.67	9.22	3.17	3.80	1.73	3.03	7.62	......
Stateburg, S. C	4.43	3.29	3.53	3.66	3.97	4.91	1.70	3.29	6.67	0.02	1.18	5.87	42.52
State College, Pa	3.27	3.56	4.29	1.73	2.37	1.67	3.08	1.65	(1)	(1)	1.66	2.17	......
Statesville, N. C	6.06	(1)	12.03	4.40	2.63	7.99	2.96	1.86	0.50	0.92	1.71	5.35	......
Station Albina, S. A.	(1)	(1)	(1)	(1)	17.18	10.36	10.43	0.70	0.00	0.00	0.99	(1)	......
Sterling, Kans	(1)	(1)	(1)	(1)	(1)	(1)	4.75	3.14	(1)	0.82	0.96	1.16	......
Stockham, Nebr	0.80	(1)	1.00	5.00	4.10	1.10	5.70	(1)	1.70	2.85	0.10	(1)	......
Strafford, Vt	3.00	4.70	5.20	2.10	4.55	1.60	3.15	3.40	0.70	1.70	4.40	3.80	38.30
Sunman, Ind	2.00	7.48	2.11	2.40	3.82	2.89	2.65	2.02	5.85	1.04	1.03	3.38	36.67
Sussex, Wis	(1)	(1)	1.91	3.61	3.11	3.70	5.64	3.14	2.70	3.01	1.97	4.75	......
Swanwick, Ill	1.15	.618	2.75	2.12	4.84	5.66	1.90	1.04	2.85	(1)	(1)	5.78	......
Swartz Creek, Mich	1.09	3.00	3.99	2.07	3.17	3.50	5.24	0.95	2.01	4.69	1.91	3.19	34.81
Sycamore, Ill	0.71	2.15	2.02	4.06	3.18	4.53	8.84	3.43	3.46	5.76	2.48	4.14	44.76
Tamaqua, Pa	3.73	(1)	(1)	3.29	4.85	3.74	6.96	7.13	1.86	2.24	2.90	7.40	......
Taunton, Mass	4.35	4.84	5.33	4.12	2.73	4.04	4.13	5.42	0.53	2.55	3.63	5.31	46.98
Tecumseh, Nebr	(1)	(1)	(1)	(1)	(1)	4.94	9.03	4.20	0.96	3.03	0.02	0.60	......
Terre Haute, Ind	0.89	5.17	2.20	3.68	3.82	5.76	7.11	1.23	4.48	1.59	2.27	5.50	43.65
Thornville, Mich	1.77	4,08	3.37	1.97	(1)	3.76	4.30	1.47	3.30	5.34	1.50	3.07	...
Topeka, Kans	0.65	2.88	3.19	4.88	3.51	5.18	5.37	5.36	6.88	2.87	1.23	1.62	42.62
Traverse City, Mich	3.19	3.07	2.29	2.12	2.11	2.79	5.78	2.85	4.50	5.74	2.86	5.70	42.50
Troy, Pa	4.32	2.25	3.85	2.88	4.19	2.63	4.76	3.09	0.77	2.07	2.03	3.28	36.12
Tucson, Ariz	(1)	(1)	(1)	(1)	0.23	0.23	0.32	1.15	0.30	2.24	0.34	4.72	......
Variety Mills, Va	4.49	7.12	8.78	2.21	2.94	5.83	3.96	2.03	0.04	0.96	2.24	4.74	44.84
Vermillion, Dak	(1)	(1)	1.50	3.42	1.68	(1)	(1)	(1)	(1)	2.18	(2)	0.70	......
Vevay, Ind	3.02	10.23	1.37	1.99	5.17	4.20	3.41	0.54	5.83	0.95	1.13	3.83	41.17
Vineland, N. J	11.56	6.78	6.59	(1)	1.99	(1)	3.86	2.63	0.47	0.80	2.81	6.53	......
Voluntown, Conn	5.80	6.30	4.25	2.45	2.90	5.20	6.40	5.90	1.80	0.90	3.10	8.00	53.00
Wabash, Ind	1.29	4.48	2.05	2.34	4.69	2.23	4.79	2.18	2.39	3.75	1.64	5.54	37.37
Washington City	5.02	6.15	6.50	1.59	2.34	6.17	6.30	0.58	0.22	1.53	3.23	4.63	44.26
Wausau, Wis	(1)	(1)	1.20	2.41	1.91	4.03	3.17	4.62	12.03	4.31	1.65	3.70	......
Wauseon, Ohio	1.93	5.02	2.78	1.42	3.95	2.79	4.20	1.12	1.85	3.01	1.46	3.38	32.91
Webster, Dak	1.42	7.46	5.30	3.73	9.19	8.01	14.65	6.41	1.48	5.09	0.92	1.52	65.18
Weir's Bridge, N. H	2.80	4.87	4.63	3.83	(1)	0.80	4.94	4.08	0.95	2.42	3.[illegible]4	3.67	......
Weldon, N. C	5.33	3.36	7.06	1.99	2.91	3.14	7.70	1.86	0.23	1.05	1.30	5.99	41.92
Wellington, Kans	0.46	0.71	1.05	3.67	4.79	4.21	1.89	3.44	1.10	2.90	1.85	3.14	29.21
Wellsborough, Pa	8.09	10.18	(1)	2.31	9.36	4.88	8.67	1.95	3.20	3.02	6.61	6.39	......
Wellsburg, W. Va	3.60	5.20	3.81	0.90	3.90	1.70	4.03	1.55	1.35	3.20	0.62	(1)	......
Westborough, Mass	5.25	7.12	5.11	4.29	3.66	3.75	3.58	(1)	1.18	2.38	2.95	5.49	......
West Chester, Pa	7.32	7.29	6.09	2.94	3.64	7.52	5.27	2.12	0.42	2.56	4.36	7.00	56.53
Westerville, Ohio	1.97	4.62	3.32	1.75	3.53	3.03	1.84	1.08	4.91	1.20	1.08	2.83	31.16
West Leavenworth, Kans	(1)	(1)	6.30	(1)	15.70	(1)	9.50	5.50	7.00	5.00	1.45	1.93	......
Westmoreland, Kans	(1)	(1)	(1)	4.20	2.88	5.50	3.50	5.75	5.75	(1)	(1)	(1)	......
White Plains, N. Y	4.30	4.35	3.31	2.70	3.20	6.40	7.65	6.64	1.12	3.60	3.32	5.05	51.64
Wilkesbarre, Pa	3.41	3.48	4.95	2.46	3.97	2.68	4.62	2.90	(1)	3.16	3.30	4.53	......

[1] No record.

[2] Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Williamstown, Mass	1.75	8.76	8.89	1.88	2.51	1.65	(1)	(1)	0.58	2.98	2.09	8.72	......
Wilton Centre, Ill	(1)	(1)	(1)	(1)	(1)	(1)	8.14	8.31	8.62	5.45	1.48	4.84	......
Wolfsborough, N. H	4.71	5.64	5.48	3.52	(1)	1.69	8.89	4.01	1.28	2.63	3.47	5.05	......
Woodstock, Md	6.12	6.69	7.65	1.63	8.20	2.74	2.87	1.67	0.23	1.45	4.27	2.15	40.17
Woodstock, N. H	2.69	5.82	5.72	2.26	(1)	1.48	8.11	3.84	1.26	4.08	4.35	4.65	......
Woodstock, Vt	8.22	3.62	4.48	2.81	3.00	1.88	2.86	2.12	(1)	2.04	4.35	4.09	......
Worcester, Mass	5.04	6.23	2.37	4.20	2.50	4.06	4.07	8.78	0.81	2.34	2.27	5.75	42.37
Wyandotte, Kans	(1)	8.51	2.66	8.36	8.78	4.71	4.64	5.86	7.10	4.07	1.15	1.64	......
Wytheville, Va	8.92	5.33	8.04	2.65	3.41	5.92	2.76	1.88	0.60	0.86	1.21	8.02	39.10
Wytheville, Va*	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.00	0.60	(1)	(1)	(1)	......
Yates Centre, Kans	0.48	1.94	1.09	8.86	1.35	2.46	2.85	1.51	5.63	8.83	1.62	2.26	28.88
Yutan, Nebr	(1)	(1)	(1)	(1)	(1)	(1)	9.19	5.22	5.06	4.66	0.02	(1)	......

[1] No record.

* Three and one-half miles from.

APPENDIX 32.

Monthly and annual precipitation at military post hospitals for the year ending December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Abraham Lincoln, Fort, Dak	1.00	0.68	0.72	1.88	2.00	5.16	3.80	4.18	2.80	1.20	0.80	1.60	25.82
Alcatraz Island, Cal	3.10	3.96	6.02	7.34	0.20	2.11	0.01	0.25	0.30	0.97	0.05	4.50	28.81
Angel Island, Cal	4.05	6.85	7.82	6.67	0.12	2.66	(2)	0.06	0.25	2.71	0.85	7.85	39.89
Assinaboine, Fort, Mont	0.16	0.42	0.53	0.25	3.05	3.95	0.00	2.59	2.74	0.41	0.42	0.78	15.30
Barrancas, Fort, Fla	7.06	3.40	6.25	6.95	9.75	11.99	11.80	2.89	(1)	(1)	(1)	2.46	.....
Benicia Barracks, Cal	3.61	4.57	7.93	4.16	0.10	2.47	0.00	0.03	0.15	1.07	0.01	7.19	31.29
Bidwell, Fort, Cal	1.14	2.96	6.57	0.68	0.40	4.29	0.67	0.08	1.55	0.78	(2)	6.33	25.45
Brady, Fort, Mich	0.73	1.22	0.69	1.27	2.73	1.43	3.14	4.29	7.00	4.35	1.25	3.32	31.42
Bridger, Fort, Wyo	0.36	0.48	0.33	0.37	1.00	0.10	0.50	2.90	0.74	0.18	0.03	0.25	7.24
Brown, Fort, Tex	(1)	(1)	(1)	(1)	(1)	(1)	0.08	0.48	7.50	10.17	1.18	0.80	.....
Buford, Fort, Dak	0.11	0.12	0.10	0.82	0.14	0.24	1.94	0.25	0.18	0.12	1.82	2.04	7.88
Columbus, Fort, N. Y. H	5.48	5.05	4.52	(1)	4.12	5.45	7.20	8.72	0.22	3.36	3.02	6.44	.....
Concho, Fort, Tex	0.40	0.80	0.50	4.60	9.83	1.77	2.20	0.96	3.64	4.16	1.50	5.85	36.21
David's Island, N. Y	3.59	3.00	3.29	1.35	3.42	3.78	2.96	5.06	0.33	4.45	2.60	6.02	39.85
Ellis, Fort, Mont	1.25	0.75	0.82	1.31	2.98	3.50	2.48	1.10	4.65	1.38	0.00	1.80	22.02
Fred Steele, Fort, Wyo	(1)	(1)	1.30	0.96	2.92	0.30	0.14	0.70	0.24	0.68	0.16	1.10	.....
Gaston, Fort, Cal	5.49	5.16	7.80	6.89	1.30	1.50	0.12	0.00	2.28	1.08	0.84	14.49	46.95
Hamilton, Fort, N. Y. H	7.53	6.06	4.22	3.16	4.49	4.75	3.65	10.04	0.46	3.41	3.01	5.40	56.18
Keogh, Fort, Mont	(1)	0.37	0.30	1.20	(1)	(1)	2.62	1.76	0.46	0.14	0.26	0.24	.....
Klamath, Fort, Oreg	2.68	1.88	3.02	1.76	0.74	3.14	0.34	(1)	0.88	1.22	(1)	3.68	.....
Lewis, Fort, Colo	0.25	3.41	4.24	(1)	1.08	1.24	0.24	2.86	1.15	2.10	(2)	4.30	.....
Lyon, Fort, Colo	(1)	(1)	0.40	1.10	3.11	1.60	2.20	1.70	0.20	0.79	0.20	(1)	.....
Madison Barracks, N. Y	2.36	2.37	2.45	0.54	3.25	0.99	3.98	(1)	2.69	2.63	2.49	2.68	.....
Mason, Fort, Cal	3.90	3.34	5.94	4.34	(2)	2.00	0.00	0.00	(2)	0.94	1.14	5.80	27.40
McDermit, Fort, Nev	6.72	4.80	4.88	4.52	3.20	4.44	1.20	(2)	1.69	1.05	0.00	1.88	34.38
McDowell, Fort, Ariz	0.14	4.37	3.47	0.06	0.45	0.09	(2)	1.18	3.10	(1)	0.48	4.14	.....
McHenry, Fort, Md	5.38	5.89	5.42	1.86	2.49	3.04	7.80	1.62	(2)	0.98	3.91	3.90	42.29
Meade, Fort, Dak	0.37	0.33	2.26	5.04	3.58	0.48	1.20	2.30	0.28	0.75	0.53	0.90	22.07
Mojave, Fort, Ariz	0.00	1.90	(1)	0.67	0.29	0.00	(2)	0.00	0.00	0.07	0.00	5.69	.....
Monroe, Fort, Va	5.10	3.56	0.53	1.42	1.53	3.99	(1)	3.12	0.16	0.20	0.58	3.02	.....
Mount Vernon Barracks, Ala	5.45	4.76	14.68	5.61	5.79	7.75	5.61	4.98	1.15	5.76	4.73	3.10	69.37
Niagara, Fort, N. Y	2.25	2.75	2.27	0.71	(1)	1.16	1.51	0.55	0.70	0.85	0.77	1.76	.....
Pembina, Fort, Dak	0.10	0.80	1.81	1.86	1.25	(1)	(1)	(1)	(1)	(1)	2.25	2.62	.....
Plattsburg Barracks, N. Y	1.88	1.84	3.49	1.08	2.29	1.60	1.98	2.19	1.69	2.42	2.03	1.26	23.75
Presidio, Cal	3.64	4.12	5.86	5.10	0.14	1.93	(2)	0.00	0.30	2.18	0.19	(1)	.....
Randall, Fort, Dak	0.58	0.47	2.98	2.80	1.70	4.31	2.32	2.39	0.04	0.97	0.04	1.08	19.68
Reno, Fort, Ind. T	0.46	0.18	(1)	3.64	6.79	4.44	2.21	3.22	3.91	4.66	3.38	2.50	.....
Robinson, Fort, Nebr	0.40	0.50	(1)	1.49	2.85	1.53	2.25	1.00	0.50	0.34	0.15	(1)	.....
Saint Augustine, Fla	1.67	3.42	1.92	2.14	1.73	7.43	3.54	10.02	1.71	1.05	3.87	1.87	40.37
Shaw, Fort, Mont	0.83	0.82	0.41	0.59	0.74	0.97	2.66	0.59	2.29	0.39	0.84	(1)	.....
Sisseton, Fort, Dak	0.35	0.82	0.82	1.26	3.00	1.32	3.45	4.27	1.43	3.63	0.52	1.31	22.18
Snelling, Fort, Minn	(1)	1.34	0.86	1.88	2.42	5.42	2.10	3.61	5.51	2.37	0.45	1.41	.....
Spokane, Fort, Wash	0.90	1.02	0.42	1.30	(2)	1.52	0.82	0.20	1.56	1.18	(1)	(1)	.....
Sully, Fort, Dak	0.29	0.47	0.87	2.28	2.04	3.00	2.57	0.72	0.76	1.04	0.17	0.63	14.84
Totten, Fort, Dak	0.68	0.54	0.98	2.90	0.98	1.89	1.92	5.94	1.98	0.98	0.25	0.63	19.67
Townsend, Fort, Wash	2.86	1.77	0.11	2.10	0.97	2.23	0.86	2.02	2.04	2.14	0.39	1.57	18.56
Union, Fort, N. Mex	0.18	0.54	0.28	0.28	4.93	3.06	0.76	7.80	1.08	(1)	(2)	(1)	.....
West Point, N. Y	(1)	(1)	(1)	2.30	3.80	2.50	3.40	(1)	1.00	(1)	5.00	6.20	..
Wingate, Fort, N. Mex	(1)	0.50	(1)	(2)	1.04	1.18	1.78	4.64	0.70	1.66	(2)	0.74	....
Yates, Fort, Dak	0.23	0.35	0.29	1.50	0.94	5.00	3.80	4.90	1.94	0.39	0.54	0.50	20.38

[1] No record.

[2] Inappreciable.

APPENDIX 33.

Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1884.

[Copied from the records on file at the office of the chief engineer C. P. R. R.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Alta, Cal	3.50	8.60	(2)	5.20	0.50	3.00	0.00	0.00	0.12	1.00	0.00	14.08	....
Anaheim, Cal	2.80	10.58	6.70	1.75	0.54	1.28	0.00	0.00	0.00	0.15	0.64	3.72	28.16
Antioch, Cal	3.50	3.64	5.73	2.62	0.00	1.15	0.00	(3)	(3)	1.25	(3)	2.89	20.78
Aptos, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.00	(1)	1.55	0.00	11.34	......
Auburn, Cal	5.33	7.63	10.17	8.02	0.85	1.23	0.00	0.00	0.56	2.25	0.00	16.37	52.41
Battle Mountain, Nev	0.70	0.23	1.04	1.54	1.29	2.18	0.00	0.10	1.12	1.94	0.00	1.82	11.96
Benson, Ariz	0.20	0.63	1.20	(3)	0.00	(1)	0.70	0.27	0.30	2.89	(1)	2.50	......
Beowawe, Nev	0.75	1.60	0.96	0.77	1.29	2.25	0.00	0.00	0.93	0.58	0.00	1.84	10.97
Bishop Creek, Nev	(1)	(1)	0.94	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	......
Blue Creek, Utah	1.14	0.70	(1)	2.16	1.01	0.52	0.00	0.00	1.80	0.50	0.10	2.50	. .
Boca, Cal	4.60	6.30	5.10	1.90	0.30	1.40	0.00	0.00	0.00	0.80	0.00	8.20	28.60
Borden, Cal	1.99	4.48	3.29	2.47	1.77	1.73	0.00	0.00	0.00	0.16	0.00	4.74	20.63
Brentwood, Cal	2.62	3.84	4.18	2.22	(3)	1.51	0.00	0.00	(3)	1.20	0.00	2.69	18.26
Brighton, Cal	2.08	3.68	5.32	3.54	0.25	1.55	0.00	0.00	0.23	1.42	0.00	6.17	24.24
Brown's, Nev	0.56	0.68	0.36	0.72	0.11	0.49	0.15	0.00	0.06	1.36	0.00	0.51	5.00
Byron, Cal	2.41	4.15	5.61	2.50	0.00	1.54	0.00	0.00	0.00	1.23	0.00	3.33	20.77
Cabazon, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0.00	0.00	0.00	0.00	2.05	.. .
Caliente, Cal	2.00	4.98	5.00	2.90	1.10	1.28	0.00	0.00	0.00	0.22	0.25	8.25	20.98
Calistoga, Cal	6.57	4.42	9.78	5.98	0.42	2.06	0.00	0.00	0.19	1.83	0.05	15.08	46.38
Carlin, Nev	1.20	1.79	1.82	1.42	1.58	1.85	0.07	0.26	0.74	1.37	0.00	2.89	14.99
Casa Grande, Ariz	0.75	(1)	1.08	0.00	0.00	(1)	0.00	2.37	0.00	1.31	0.00	3.20	......
Chico, Cal	2.48	2.16	5.57	2.93	0.40	2.11	0.00	0.00	0.86	1.40	0.00	5.28	23.19
Chualar, Cal	1.72	(1)	5.17	2.73	(3)	1.78	0.00	(1)	0.07	2.08	0.24	2.79	......
Cisco, Cal	3.40	12.00	14.65	10.10	0.00	8.54	0.00	0.00	0.00	2.32	0.00	25.05	76.06
Colfax, Cal	7.54	9.73	12.27	10.94	1.38	3.01	0.00	(3)	0.80	2.55	(3)	23.60	71.82
Colton, Cal	1.00	11.88	4.05	2.85	2.90	0.82	0.00	0.25	0.00	0.25	0.12	3.93	27.05
Corinne, Utah	0.55	1.90	3.80	2.10	1.75	0.70	0.20	0.30	2.90	1.05	0.05	3.65	18.95
Daggett, Cal	0.48	1.44	1.17	0.10	0.49	0.00	0.00	0.00	(4)	.....	.....	.....	......
Davisville, Cal	3.07	3.78	5.09	3.07	0.00	1.39	0.00	0.00	0.28	1.48	0.00	5.25	23.41
Delano, Cal	1.61	2.38	1.98	2.31	(2)	0.22	0.00	0.00	0.00	0.00	0.16	2.16	......
Delta, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	6.01	0.56	16.14	......
Deming, N. Mex	0.81	0.70	0.20	0.20	0.00	0.00	0.52	1.04	0.80	1.53	(1)	1.35	......
Dunnigan, Cal	3.26	3.21	5.78	2.78	(3)	2.59	0.00	0.00	0.04	1.28	0.00	7.16	26.10
Elko, Nev	1.20	1.00	1.40	0.72	0.65	1.27	(1)	0.00	1.00	0.59	0.00	3.41	......
El Paso, Tex	0.25	0.20	0.12	0.07	0.00	(1)	0.00	1.56	(1)	(1)	0.05	0.57	......
Emigrant Gap, Cal	8.22	10.20	15.18	10.84	2.10	2.77	0.00	0.00	0.51	1.93	0.00	31.20	82.95
Farmington, Cal	1.44	5.04	6.53	4.72	0.35	1.32	0.00	0.00	0.09	1.15	0.00	6.21	26.85
Fenner, Cal	0.15	1.30	1.25	0.15	1.09	0.05	0.00	(1)	0.00	(4)	.....	.....	......
Fresno City, Cal	2.29	3.18	2.81	2.85	1.11	1.29	0.00	(1)	0.00	0.35	0.08	3.98	......
Galt, Cal	1.70	4.09	5.46	2.09	0.58	1.36	0.00	0.00	0.00	1.31	0.00	6.06	22.65
Gilroy, Cal	2.94	6.65	7.24	3.80	0.34	1.24	0.00	0.11	0.12	1.73	0.06	8.83	33.06
Golconda, Nev	0.69	0.78	1.81	1.91	1.51	(1)	0.00	0.10	0.57	0.44	0.00	1.12	......
Goshen, Cal	1.56	3.80	1.71	1.97	0.54	(1)	0.00	0.00	0.00	0.36	0.00	3.75	......
Halleck, Nev	0.60	0.72	1.99	1.80	1.03	0.56	0.03	0.14	(1)	0.30	0.00	1.33	......
Hawthorne, Nev	(1)	(1)	(1)	0.18	0.69	0.89	0.00	0.10	0.00	0.05	0.00	0.52	......
Hollister, Cal	1.05	3.80	4.38	2.66	0.62	1.85	0.00	0.05	0.00	1.30	0.00	3.62	19.33
Hot Springs, Nev	0.70	0.80	(1)	0.44	0.29	1.28	0.04	0.08	0.00	0.33	0.00	0.50	......
Humboldt, Nev	1.20	0.75	0.39	0.51	0.00	(1)	0.00	(1)	0.00	1.28	0.00	0.51	......
Indio, Cal	0.00	3.16	0.62	0.44	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.68
Ione, Cal	2.81	6.13	7.87	6.51	0.39	2.03	0.00	0.00	0.00	1.82	0.00	8.22	35.78
Keeler, Cal	(1)	(1)	(1)	0.20	1.60	0.80	0.00	0.20	0.00	0.00	0.00	0.70	.. .
Keene, Cal	2.14	7.46	4.80	3.16	3.23	1.79	0.00	0.00	(3)	2.55	0.36	5.22	30.71
Kelton, Utah	0.05	0.72	2.20	1.80	0.81	0.85	0.15	0.34	1.97	(1)	0.00	3.35	......
Kingsburg, Cal	2.47	4.09	4.09	2.17	1.00	0.92	0.00	0.00	0.00	0.26	0.09	4.56	19.65
Knight's Landing, Cal	3.68	3.53	4.88	3.15	0.00	1.89	0.00	(1)	0.35	1.45	0.00	5.56	......
Lathrop, Cal	1.14	4.17	4.86	2.57	0.36	1.02	0.00	(1)	0.10	0.82	0.00	2.97	......
Lemoore, Cal	3.50	3.21	3.40	3.25	0.40	1.49	0.00	0.00	(1)	0.25	0.20	3.87	......
Livermore, Cal	4.03	5.29	5.92	2.70	0.20	1.73	0.00	0.10	0.30	1.14	0.02	6.22	27.65
Lordsburg, N. Mex	0.80	0.13	2.10	0.20	(3)	0.00	2.20	1.30	2.35	2.55	0.00	1.46	13.09
Los Angeles, Cal	3.02	10.74	9.85	3.15	0.70	1.30	0.00	0.00	0.00	0.30	0.85	4.21	34.12
Mammoth Tank, Cal	(3)	1.36	0.22	0.07	0.19	0.00	0.00	(3)	0.00	0.00	0.00	0.87	2.71

[1] No record. [2] Record incomplete. [3] Inappreciable. [4] Observations discontinued.

***Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads, &c.*—Continued.**

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
Maricopa, Ariz	1.05	3.58	2.20	0.10	0.00	(1)	(1)	0.00	0.40	3.43	0.08	2.08	
Martinez, Cal	3.57	4.65	7.97	3.17	0.00	2.00	0.00	0.00	0.13	1.13	0.00	4.76	27.38
Marysville, Cal	2.49	2.82	3.31	2.57	0.00	1.18	0.00	0.00	0.09	1.74	0.00	4.24	18.44
Menlo Park, Cal	3.35	4.07	4.80	2.76	0.00	3.16	0.00	0.05	0.04	(1)	0.27	4.92	......
Merced, Cal	1.64	4.39	5.38	5.60	0.86	1.73	0.00	0.00	0.00	0.54	0.02	3.63	23.79
Modesto, Cal	0.75	2.01	3.89	2.85	0.15	0.99	0.00	(1)	0.00	1.20	0.00	2.62	......
Mojave, Cal	1.77	7.67	2.17	(3)	0.00	0.00	0.00	0.10	(1)	0.13	(1)	(1)	......
Monterey, Cal	2.60	4.34	6.08	3.75	0.36	1.80	0.00	0.07	0.03	1.81	0.30	5.33	26.47
Napa City, Cal	3.02	3.89	5.72	0.00	0.13	2.12	0.00	0.00	(1)	0.70	0.00	10.16	.....
Needles, Ariz	0.00	1.86	2.08	0.10	0.75	0.00	0.00	0.00	0.00	(4)	......	......	......
Newhall, Cal	6.66	14.53	9.73	3.85	2.17	1.67	0.00	0.00	0.00	0.60	1.10	3.89	44.20
Niles, Cal	3.78	6.18	5.41	3.74	0.18	2.69	0.00	0.00	0.34	1.30	0.00	5.75	29.37
Oakland, Cal	2.93	4.46	8.18	4.58	0.30	2.83	0.00	0.00	0.20	2.77	0.00	6.10	32.35
Ogden, Utah	0.77	2.21	3.63	3.85	1.51	0.61	0.00	0.08	2.41	1.46	0.00	2.96	19.49
Orland, Cal	3.38	1.58	4.31	2.97	0.23	2.55	0.00	0.00	0.20	0.80	0.00	4.03	20.05
Otego, Nev	1.05	0.85	1.20	1.91	1.26	1.21	0.04	0.60	0.42	1.03	0.00	3.15	12.72
Pajaro, Cal	2.68	6.33	5.83	3.61	0.32	1.47	0.00	0.15	0.18	1.92	0.20	7.45	30.14
Palisade, Nev	0.38	1.00	2.17	1.50	1.30	1.72	0.05	0.22	1.09	1.60	0.00	2.07	13.10
Pantano, Ariz	0.31	1.64	0.63	0.00	0.33	(1)	0.40	2.60	1.45	2.80	0.85	4.70	......
Petaluma, Cal	4.85	3.96	4.86	5.53	0.31	2.80	0.00	0.02	0.13	(1)	0.12	8.07	......
Pleasanton, Cal	3.41	6.18	6.53	3.14	0.05	1.78	0.00	0.09	0.08	0.99	0.00	4.47	26.72
Promontory, Utah	0.90	1.75	1.08	4.37	1.42	1.02	0.00	0.00	2.17	0.56	(1)	1.40	......
Ravenna, Cal	4.58	9.50	6.06	2.15	0.20	1.65	0.00	0.25	0.10	0.30	0.80	3.00	28.59
Red Bluff, Cal	3.73	2.60	7.99	4.36	0.25	1.24	0.00	0.00	0.20	1.00	0.00	8.00	29.37
Redding, Cal	5.45	3.94	(1)	2.65	0.00	0.00	0.00	(1)	0.02	1.36	0.00	14.51	......
Reno, Nev	1.70	1.25	1.30	0.35	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.77	6.17
Rocklin, Cal	3.27	4.56	5.77	4.19	0.00	1.20	0.00	0.00	(1)	1.85	(1)	7.75	......
Sacramento, Cal	2.71	3.85	6.50	3.60	0.00	1.35	0.00	(3)	0.48	1.80	0.00	7.40	27.69
Salinas, Cal	1.52	4.63	4.69	2.87	0.71	2.54	0.00	0.09	0.14	1.81	0.18	4.28	23.46
San Fernando, Cal	3.00	10.60	10.51	3.48	1.05	(1)	0.00	0.00	0.00	0.42	(1)	4.96	......
San José, Cal	3.18	3.68	6.23	3.38	0.05	2.15	0.00	0.00	0.08	(1)	0.06	3.90	......
San Mateo, Cal	3.40	4.88	6.38	3.40	0.05	2.91	0.00	(1)	0.17	1.78	0.21	7.59	......
San Simon, Ariz	0.40	0.60	2.21	0.00	0.84	0.08	1.21	2.47	0.40	1.63	0.00	1.03	10.37
Santa Cruz, Cal	3.30	5.27	8.76	6.78	0.11	2.48	0.00	0.10	0.33	1.37	0.32	8.91	37.73
Soledad, Cal	2.74	4.24	3.74	1.67	1.13	1.56	0.00	0.10	0.00	1.78	0.30	1.74	19.00
South Vallejo, Cal	2.52	3.21	6.06	3.14	0.00	1.74	0.00	0.00	(1)	1.09	0.00	6.03	......
Spadra, Cal	2.90	8.80	7.00	2.25	0.55	0.75	0.00	0.00	(3)	0.00	0.81	2.82	25.88
Stockton, Cal	1.68	4.02	5.77	2.65	0.81	1.05	0.00	0.00	(1)	1.58	0.00	5.49	......
Suisun City, Cal	2.64	4.48	6.33	3.78	0.30	1.69	0.00	(1)	(1)	0.70	0.00	7.46	......
Summit, Cal	7.60	12.70	9.10	12.60	0.80	4.04	0.00	0.00	0.00	3.13	0.00	9.40	59.37
Sumner, Cal	1.48	2.20	1.06	1.27	1.74	0.80	0.00	0.00	0.00	0.00	0.40	3.35	12.40
Tecoma, Nev	0.10	0.87	0.93	2.16	1.10	0.50	0.10	0.10	1.83	0.88	(1)	1.69	......
Tehama, Cal	3.15	2.08	4.94	2.61	(1)	1.55	0.00	0.00	(1)	0.69	0.00	(3)	......
Tehichipa, Cal	1.54	7.26	3.46	1.85	1.26	1.05	0.00	0.64	0.00	0.13	0.29	2.76	20.24
Tennant, Cal	5.23	5.96	10.09	4.19	0.14	1.42	0.00	0.22	0.27	1.76	0.12	8.11	37.51
Terrace, Utah	0.70	0.90	1.58	1.74	1.02	0.46	0.03	0.05	1.61	(1)	0.00	1.38	......
Texas Hill, Ariz	0.22	1.81	1.75	0.23	0.28	0.00	(1)	0.00	0.02	0.00	0.00	1.31	......
Toano, Nev	0.70	0.78	0.68	1.87	1.60	0.55	0.00	0.13	0.80	1.25	0.00	2.20	10.56
Tracy, Cal	0.90	3.43	3.27	1.65	0.10	2.05	0.00	0.10	0.00	0.82	0.00	2.49	14.81
Truckee, Cal	6.65	11.20	5.36	3.90	0.06	1.02	0.00	0.00	(1)	1.50	0.00	13.24	......
Tucson, Ariz	0.08	3.30	0.14	0.20	0.00	0.10	0.65	0.70	0.45	1.50	0.70	3.90	4.72
Tulare, Cal	1.16	2.97	2.64	1.97	0.48	1.02	0.00	0.00	0.00	0.16	0.08	2.61	13.09
Turlock, Cal	1.47	2.94	2.00	2.20	0.73	1.93	0.00	0.00	0.08	0.85	0.00	2.46	14.66
Wadsworth, Nev	0.25	0.50	0.98	0.00	0.27	1.40	0.05	0.02	0.05	0.00	0.00	0.85	4.37
Wells, Nev	0.70	0.70	1.17	1.14	1.48	1.57	0.00	0.17	0.23	2.80	0.00	1.80	11.76
Wilcox, Ariz	0.64	2.44	1.86	0.02	0.07	0.11	1.25	1.88	(3)	3.49	0.21	2.99	14.46
Williams, Cal	3.01	1.58	3.93	1.96	(3)	2.96	0.00	0.00	0.28	0.45	0.00	4.27	18.44
Willow, Cal	5.42	3.11	4.80	2.58	0.12	0.90	0.00	0.00	0.18	0.69	0.00	4.18	21.93
Winnemucca, Nev	1.05	1.00	5.23	1.53	2.19	1.83	0.33	0.00	0.00	1.92	0.00	5.82	20.90
Woodland, Cal	3.47	3.44	4.69	3.88	0.00	(1)	0.00	0.00	(3)	(1)	0.00	4.63	......
Yuma, Ariz	(3)	1.11	1.48	0.07	0.27	(1)	0.00	(3)	(1)	0.00	0.00	1.91	......

[1] No record. [2] Record incomplete. [3] Inappreciable. [4] Observations discontinued.

APPENDIX 34.

Precipitation at the cotton-region stations of the Signal Service, United States Army, for the months July to October, 1884, inclusive, and May and June, 1885.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Wilmington, N. C.:	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Charlotte, N. C	7.82	2.16	3.57	1.51	6.48	3.48
Cheraw, S. C	8.84	2.97	8.51	0.28	5.58	4.98
Florence, S. C	9.61	1.73	5.41	0.12	4.71	5.64
Goldsborough, N. C	3.98	4.28	2.53	0.88	5.87	3.31
Lumberton, N. C	4.47	5.81	6.08	0.11	6.46	7.67
New Berne, N. C	8.57	7.38	3.18	0.41	10.86	5.17
Raleigh, N. C	8.82	3.57	0.78	0.69	7.00	0.99
Salisbury, N. C	1.85	1.07	0.26	0.97	6.35	8.60
Wadesborough, N. C	7.93	1.45	1.50	0.25	8.97	1.78
Weldon, N. C	7.97	2.32	0.08	1.21	8.59	1.85
Wilmington, N. C	8.73	9.06	9.85	0.62	8.58	8.20
Charleston, S. C.:						
Branchville, S. C	5.21	5.07	4.27	0.03	1.03	5.47
Charleston, S. C	9.84	6.80	11.03	0.35	2.20	5.96
Hardeeville, S. C	4.08	9.84	5.65	0.20	4.73	12.95
Jacksonborough, S. C	11.28	8.46	2.13	0.45	3.08	5.95
Kingston, S. C	6.63	5.01	0.56	0.03	5.85	5.64
Saint George's, S. C	8.52	3.42	5.44	0.00	3.73	4.85
Saint Matthew's, S. C	4.79	4.10	4.93	0.00	4.51	5.57
Yemassee, S. C	6.88	6.61	6.01	0.22	5.67	6.20
Augusta, Ga.:						
Allendale, S. C	3.97	5.49	4.19	0.00	5.77	4.12
Athens, Ga	7.02	2.84	0.00	0.52	6.95	4.01
Augusta, Ga	3.41	4.35	4.23	0.83	5.87	2.80
Batesburg, S. C	4.45	5.14	5.09	0.00	4.59	5.29
Blackville, S. C	3.99	4.38	6.49	0.27	2.64	7.20
Camak, Ga	2.62	2.04	0.64	0.27	6.04	5.22
Chester, S. C	1.40	0.42	3.25	0.00	1.71	2.46
Columbia, S. C	2.48	3.53	5.09	0.00	9.21	4.90
Greenwood, S. C	5.82	4.65	1.49	0.24	4.09	4.18
Union Point, Ga	....	....	....	....	3.65	2.47
Washington, Ga	2.81	1.26	0.70	1.48	8.42	4.33
Waynesborough, Ga	2.80	4.68	3.15	0.00	4.79	3.49
Savannah, Ga.:						
Albany, Ga	8.57	3.75	0.88	0.00	5.07	3.32
Allapaha, Ga	6.23	6.74	1.80	0.00	4.09	1.74
Bainbridge, Ga	0.84	0.35	0.15	0.00	0.44	0.31
Cedar Keys, Fla	6.02	8.11	3.63	0.13	3.48	10.98
Eastman, Ga	(1)	1.47	(1)	[3]0.00	0.19	0.15
Fernandina, Fla	5.00	7.02	(1)	1.00	5.21	3.97
Fort Gaines, Ga	4.68	3.39	0.84	0.00	3.21	2.21
Jessup, Ga	5.62	7.86	2.92	1.00	3.48	8.00
Live Oak, Fla	3.77	3.72	0.50	0.27	5.58	6.97
Millen, Ga	5.77	3.12	3.18	0.07	3.12	4.86
Quitman, Ga	3.66	1.58	2.35	0.76	4.59	1.66
Savannah, Ga	3.74	[2]8.46	4.55	2.29	3.98	8.10
Smithville, Ga	1.85	2.09	0.44	0.00	4.64	2.38
Thomasville, Ga	5.14	2.05	1.05	0.22	3.08	6.15
Waldo, Fla	0.74	4.93	(1)	1.12	6.30	1.89
Way Cross, Ga	4.86	10.12	2.60	0.70	5.15	4.85
Atlanta, Ga.:						
Anderson, S. C	2.58	1.92	0.06	0.78	2.35	3.74
Atlanta, Ga	2.46	2.08	0.08	0.70	6.21	4.63
Cartersville, Ga	4.80	1.28	1.32	0.77	6.08	3.61
Columbus, Ga	5.22	1.43	(1)	0.03	6.01	3.83
Dalton, Ga	6.51	1.79	1.37	0.93	7.25	6.16
Gainesville, Ga	4.94	0.52	1.18	0.10	4.04	2.81
Greenville, S. C	7.25	1.42	0.00	0.10	4.16	4.27
Griffin, Ga	3.45	3.79	1.11	0.68	6.88	3.09

[1] No record.

[2] 26 days only.

[3] 23 days only.

Precipitation at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Atlanta, Ga.—Continued:	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Macon, Ga	4.03	1.87	0.18	0.32	5.18	3.35
Newnan, Ga	3.54	2.74	0.11	0.52	6.69	3.29
Spartanburg, S. C	3.83	1.61	0.75	0.06	4.83	3.99
Toccoa, Ga	5.66	2.14	1.12	0.40	8.01	1.75
West Point, Ga	8.23	4.11	0.06	0.60	4.59	5.83
Montgomery, Ala.:						
Birmingham, Ala	5.29	1.74	0.10	1.01	6.48	3.49
Calera, Ala	2.08	3.04	0.00	0.15	5.21	4.40
Eufaula, Ala	8.98	3.88	0.14	0.03	8.02	1.66
Fort Deposit, Ala	0.34	0.66	0.00	0.12	5.08	2.60
Greenville, Ala	(1)	2.78	0.25	1.03	14.45	9.16
Marion, Ala	3.91	4.33	0.00	1.90	3.03	1.07
Montgomery, Ala	3.10	3.05	0.58	1.87	8.02	4.12
Opelika, Ala	5.88	1.47	0.20	0.56	7.13	3.38
Pine Apple, Ala	3.88	3.25	0.60	1.09	3.95	2.68
Selma, Ala	7.21	2.28	0.00	2.95	2.64	1.28
Mobile, Ala.:						
Aberdeen, Miss	4.91	0.78	2.98	0.60	4.82	2.44
Columbus, Miss	10.20	0.88	0.42	0.81	6.44	4.30
Evergreen, Ala	7.53	3.87	(1)	1.75	(1)	(1)
Livingston, Ala	5.77	4.89	0.43	[2]1.26	[3]3.68	(1)
Macon, Miss	5.18	1.25	0.40	0.50	7.31	0.15
Meridian, Miss	0.03	0.15	0.01	0.13	(4)	(1)
Mobile, Ala	4.96	1.26	1.78	5.36	3.27	4.15
Okalona, Miss	6.90	1.30	0.06	0.90	5.23	2.50
Waynesborough, Miss	6.98	2.46	0.55	2.05	3.13	2.50
New Orleans, La.:						
Alexandria, La	4.71	0.62	4.70	3.45	3.56	2.56
Amite City, La	1.13	3.52	0.94	5.02	0.09	0.11
Brookhaven, Miss	0.48	4.18	2.28	1.73	0.84	4.07
Cheneyville, La	1.45	1.06	3.17	3.25	2.88	3.62
Coushatta Chute, La	1.86	1.68	1.81	2.10	2.86	3.82
Hazlehurst, Miss	0.14	0.53	0.06	0.15	0.11	0.37
Lafayette, La	4.57	1.89	2.55	4.10	5.84	4.11
Minden, La	1.24	2.27	1.76	1.02	2.41	2.70
Natchez, Miss	0.62	3.87	2.87	2.98	3.52	1.89
Natchitoches, La	0.00	2.30	2.45	1.90	3.87	2.38
New Orleans, La	4.12	0.87	3.12	5.60	5.77	3.30
Opelousas, La	3.99	0.55	2.11	2.59	4.77	4.22
Shreveport, La	0.06	1.99	2.10	0.53	3.70	5.77
Whiteville, La	1.87	1.69	2.22	0.70	4.15	(5)
Galveston, Tex.:						
Austin, Tex	(1)	(1)	2.34	(1)	(1)	0.37
Beaumont, Tex	(1)	[6]1.96	5.82	(1)	(1)	(1)
Belton, Tex	0.42	(1)	3.77	(1)	2.97	0.06
Columbia, Tex	0.30	0.65	4.71	(1)	5.20	0.57
Corsicana, Tex	0.00	(1)	0.04	(1)	(1)	3.36
Cuero, Tex	0.00	0.32	2.29	(1)	[7]4.03	0.30
Dallas, Tex	0.00	2.22	0.00	1.43	[7]6.99	9.60
Galveston, Tex	1.95	1.77	7.04	7.37	6.41	3.26
Hearne, Tex	0.00	0.94	2.40	(1)	9.54	0.00
Hempstead, Tex	0.01	0.03	4.05	(1)	(5)	......
Houston, Tex	1.61	1.83	10.02	5.28	4.55	2.43
Huntsville, Tex	(1)	0.38	2.81	(1)	6.33	0.71
Longview, Tex	0.03	1.01	3.16	(1)	4.92	5.86
Luling, Tex	(1)	0.70	2.53	1.76	(1)	0.00
Orange, Tex	[8]0.20	0.18	1.20	0.26	(1)	0.10
Palestine, Tex	0.06	0.66	3.99	1.45	6.08	2.07
San Antonio, Tex	0.00	0.22	2.83	1.53	[9]6.79	0.86
Sour Lake, Tex	0.94	3.22	3.28	4.45	[8]3.10	5.06
Tyler, Tex	0.00	2.01	3.25	(1)	2.08	1.24
Waco, Tex	0.06	(1)	1.10	(1)	12.44	2.22
Weatherford, Tex	(1)	(1)	0.29	(1)	7.50	4.23
Weimar, Tex	0.00	0.70	3.66	0.88	10.43	0.18
Vicksburg, Miss.:						
Edwards, Miss	4.38	1.84	1.87	1.33	2.59	0.81
Jackson, Miss	0.20	1.63	2.45	1.14	2.39	1.71
Lake, Miss	5.88	6.80	1.90	1.89	3.86	2.45
Monroe, La	3.83	3.48	1.46	1.55	3.43	4.10

[1] No record.
[2] 24 days only.
[3] 25 days only.
[4] Record incomplete.
[5] Observations discontinued.
[6] 20 days only.
[7] 27 days only.
[8] 18 days only.
[9] 23 days only.

Precipitation at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Vicksburg, Miss.—Continued:	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Vicksburg, Miss	4.99	2.88	5.12	1.08	4.75	2.90
Little Rock, Ark.:						
Arkansas City, Ark	2.97	1.02	2.70	(¹)	(¹)	(²)
Brinkley, Ark	3.56	1.48	5.51	0.30	0.90	1.62
Devall's Bluff, Ark	3.60	1.20	3.50	1.19	4.23	2.71
Fort Smith, Ark	5.98	3.73	5.03	1.31	2.59	4.88
Helena, Ark	4.42	1.04	1.94	1.10	0.43	2.43
Kensett, Ark	3.40	2.20	3.00	1.45	1.24	3.96
Little Rock, Ark	4.28	3.26	5.60	1.30	3.26	3.39
Madison, Ark	4.40	0.50	4.30	0.60	1.60	1.30
Magnolia, Ark	3.00	3.73	2.53	0.65	1.85	5.74
Malvern, Ark	4.96	2.56	1.38	0.05	6.11	3.67
Monticello, Ark	2.61	2.37	3.30	1.10	5.05	3.55
Newport, Ark	1.20	0.91	7.91	1.14	1.09	2.08
Paris, Tex	0.48	1.28	1.95	(²)	2.52	2.34
Pine Bluff, Ark	2.04	0.78	2.37	1.14	3.15	2.45
Prescott, Ark	0.72	0.99	4.20	0.77	2.16	1.17
Russellville, Ark	(³) 4.12	0.33	7.38	(¹)	1.58	2.95
Texarkana, Ark	0.98	1.21	3.00	0.40	(¹)	4.03
Memphis, Tenn.:						
Batesville, Ark	7.23	2.43	1.91	1.85	1.45	3.06
Bolivar, Tenn	3.75	0.70	2.12	(¹)	2.40	5.95
Brownsville, Tenn	5.99	2.53	2.14	1.42	1.07	9.75
Corinth, Miss	3.06	2.40	0.83	2.90	0.33	0.38
Covington, Tenn	1.90	2.65	2.56	3.13	1.57	4.75
Decatur, Ala	6.47	1.58	0.29	1.81	5.92	4.76
Dyersburg, Tenn	4.83	2.61	3.75	3.04	3.25	7.12
Grand Junction, Tenn	5.11	1.21	1.24	2.43	2.26	6.56
Grenada, Miss	2.82	1.08	0.58	1.38	2.57	1.95
Hernando, Miss	5.88	2.73	2.41	1.69	0.60	4.03
Holly Springs, Miss	4.98	2.18	0.83	2.21	2.32	4.63
Memphis, Tenn	2.88	1.27	4.29	2.83	3.05	1.52
Milan, Tenn	3.28	1.11	4.83	1.61	3.17	5.19
Nashville, Tenn	3.16	2.73	2.31	2.38	4.32	3.70
Oxford, Miss	4.70	1.75	2.30	1.20	1.52	6.68
Paris, Tenn	2.83	1.81	5.26	4.59	2.99	5.25
Scottsborough, Ala	7.64	0.25	0.67	2.57	(⁴) 7.45	5.98
Tuscumbia, Ala	5.16	1.95	1.05	0.70	3.54	0.63
Withe, Tenn	(²)	0.27	0.79	0.80	0.15	0.30

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[1] No record. [2] Record incomplete. [3] 19 days only. [4] 26 days only.

APPENDIX 35.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including July, 1872.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Mount Washington, N. H.	73.6	67.7	67.0	78.9	81.9	83.2	85.7	82.5	76.7	75.7	70.3	73.5	.
Boston, Mass	65.4	63.6	66.8	61.9	60.6	69.2	68.4	71.2	67.2	69.6	65.5	68.6	66.2
New London, Conn	74.9	73.2	73.8	69.8	68.5	72.3	74.6	80.1	72.5	76.7	71.4	74.0	....
Middle Atlantic States:													
New York City	69.4	63.8	67.6	62.0	61.3	67.4	72.1	75.3	69.5	72.8	70.8	71.6	.....
Philadelphia, Pa	71.9	68.2	67.2	59.8	58.9	67.2	67.9	72.0	66.5	71.5	68.7	72.1	69.6
Cape May, N. J	73.7	78.1	77.7	69.4	76.4	83.4	82.6	85.5	74.4	80.1	72.2	74.2	.
Baltimore, Md	65.3	63.2	70.4	58.3	58.3	64.0	62.8	70.5	65.8	67.1	67.1	64.0	68.2
Washington City	65.8	64.6	64.8	55.2	61.0	64.8	65.0	72.6	68.6	74.0	68.5	67.0	68.2
Lynchburg, Va	65.8	69.5	59.0	62.6	64.1	72.9	77.0	77.1	75.1	76.8	73.1	71.0	.....
South Atlantic States:													
Wilmington, N. C	71.7	75.2	74.0	70.4	69.5	74.1	73.3	82.5	77.1	80.4	76.0	73.9	.....
Charleston, S. C	74.6	74.0	74.6	69.8	71.2	74.8	75.2	88.5	78.3	81.5	77.0	75.8	77.1
Augusta, Ga	72.4	74.6	73.4	67.8	69.0	69.9	72.8	76.8	74.2	76.8	77.1	74.8	.....
Savannah, Ga	71.1	74.9	76.2	68.6	70.4	75.0	73.0	81.8	83.3	84.5	78.2	75.8	77.1
Florida Peninsula:													
Key West, Fla	80.3	77.8	75.1	70.6	69.1	69.4	70.2	71.6	77.6	79.8	78.0	80.3	75.9
Eastern Gulf States:													
Mobile, Ala	74.6	79.7	78.5	73.5	71.9	76.0	78.6	74.9	78.6	77.9	78.2	79.6	77.0
New Orleans, La	73.0	74.0	75.0	73.0	73.0	75.0	74.0	79.0	77.0	78.0	75.0	76.5	76.1
Western Gulf States:													
Galveston, Tex	76.6	80.0	81.3	79.0	69.6	73.1	71.9	71.8	75.2	81.0	77.9	81.9	.....
Ohio Valley and Tennessee:													
Knoxville, Tenn	71.9	69.6	62.3	59.8	70.0	76.6	74.6	68.1	73.7	74.2	75.0	70.1	71.1
Memphis, Tenn	64.8	69.7	62.6	61.7	64.6	68.8	72.8	74.3	68.9	71.0	74.1	65.5	.....
Nashville, Tenn	63.4	68.8	58.6	60.1	59.7	66.5	68.8	66.7	67.9	64.9	73.8	65.7	.....
Indianapolis, Ind	79.9	74.9	68.4	60.1	64.6	68.4	69.2	72.4	70.9	67.6	74.9	74.3	.....
Cincinnati, Ohio	76.9	74.3	70.0	60.6	59.0	59.2	64.5	70.5	73.8	71.7	73.6	71.8	.....
Pittsburg, Pa	61.5	57.3	59.3	57.6	63.2	64.2	67.2	69.1	66.6	58.8	65.2	68.2	.....
Lower Lakes:													
Oswego, N. Y	71.0	68.3	71.8	65.5	64.6	69.0	68.9	66.5	66.5	62.7	70.3	75.1	67.8
Rochester, N. Y	76.4	70.4	71.3	63.0	61.0	64.5	65.8	60.8	68.1	61.6	72.4	73.6	67.9
Cleveland, Ohio	74.3	67.3	65.4	59.9	66.7	69.0	69.7	75.0	69.4	65.1	72.6	71.0	69.5
Toledo, Ohio	76.4	78.2	69.0	62.2	61.2	66.8	68.1	77.4	70.9	64.2	72.6	65.7	70.5
Detroit, Mich	82.0	73.8	72.4	64.6	63.8	71.2	71.9	75.8	72.9	64.2	81.7	86.6	.....
Upper Lakes:													
Escanaba, Mich	77.0	77.1	74.0	73.4	78.7	77.0	77.2	78.4	80.2	81.0	67.8	65.9	.....
Grand Haven, Mich	78.8	75.2	75.7	63.4	67.3	71.8	71.8	74.4	74.3	67.4	79.1	81.6	.....
Marquette, Mich	84.0	81.7	81.8	63.6	60.8	64.0	66.7	61.3	59.0	65.0	74.3	76.5	.....
Duluth, Minn	73.2	61.4	59.6	68.8	69.4	67.8	69.8	66.2	65.4	66.2	75.2	71.4	.....
Upper Mississippi Valley:													
Saint Paul, Minn	66.3	68.6	67.8	68.8	64.9	71.0	72.4	72.8	69.5	68.5	72.7	71.0	.....
Keokuk, Iowa	70.6	67.6	67.1	60.8	62.2	64.0	68.1	67.4	64.6	64.0	75.0	67.2	.....
Cairo, Ill	70.0	69.7	56.8	56.2	65.2	69.3	74.0	75.4	75.0	70.0	69.7	65.5	.
Saint Louis, Mo	69.4	66.8	61.4	56.4	64.4	66.6	74.0	68.3	63.9	59.2	71.5	65.3	67.5
Missouri Valley:													
Leavenworth, Kans	73.5	72.8	67.1	61.9	66.4	56.4	63.4	52.1	43.1	35.4	42.2	64.5	.....
Omaha, Nebr	71.5	74.0	68.6	58.4	68.6	67.8	72.6	72.1	67.9	60.1	71.8	72.8	68.9
Northern Slope:													
Cheyenne, Wyo	41.6	48.8	53.0	56.8	59.6	55.2	59.4	49.4	54.9	48.9	62.8	61.4	.....
Middle Pacific Coast:													
San Francisco, Cal	75.2	82.7	84.4	70.4	71.7	71.6	80.8	81.1	77.4	64.4	68.1	81.1	.....

APPENDIX 36.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from September, 1872, to and including October, 1879, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
New England:													
Eastport, Me	79.4	77.7	77.6	78.4	78.0	78.3	79.5	79.7	80.1	77.2	77.1	78.1	77.7
Portland, Me	75.0	71.5	71.1	65.9	68.7	68.5	70.3	71.9	74.0	71.3	72.3	74.5	70.6
Mount Washington, N. H	87.1	85.2	86.5	87.9	84.0	84.2	87.0	85.3	85.6	89.0	88.1	84.3	86.5
Burlington, Vt	72.3	70.5	71.0	66.9	62.2	64.6	66.4	68.1	69.6	68.7	69.3	71.9	68.5
Boston, Mass	73.8	71.4	70.8	67.1	62.3	67.0	69.4	71.8	73.2	69.2	72.3	73.9	70.3
New Haven, Conn	75.2	73.4	71.6	65.2	63.8	70,2	70.7	74.0	74.8	71.7	72.5	74.0	71.2
New London, Conn	74.8	70.6	71.8	67.8	67.6	75.1	75.7	76.4	75.8	72.8	71.5	70.9	72.5
Middle Atlantic States:													
Albany, N. Y	80.4	78.6	76.8	69.2	65.4	70.4	71.2	71.5	75.0	77.1	82.1	80.3	75.5
New York City	70.2	70.6	65.5	64.7	62.2	68.1	69.6	69.8	72.1	67.9	68.3	69.9	68.0
Philadelphia, Pa	73.5	67.5	64.9	62.6	60.6	66.8	66.1	70.9	70.8	67.2	67.5	71.4	67.3
Atlantic City, N. J	82.8	77.6	78.6	76.5	77.5	82.2	83.1	83.0	81.1	78.4	77.7	80.6	79.9
Barnegat City, N. J	81.8	78.8	78.4	75.6	74.6	79.8	80.9	79.3	78.5	77.1	78.6	80.0	78.4
Cape May, N. J	78.4	77.1	76.3	75.5	75.8	79.3	80.6	80.8	76.8	74.4	74.1	75.2	77.3
Sandy Hook, N. J	76.2	73.8	74.2	72.8	70.0	78.9	74.5	78.8	75.2	71.9	73.2	74.1	73.9
Baltimore, Md	71.5	67.9	65.1	61.5	60.7	64.5	64.5	70.5	71.6	68.0	67.1	68.7	67.3
Washington City	72.6	67.9	63.3	62.6	62.8	66.3	66.2	73.5	73.4	70.4	71.1	71.4	69.0
Cape Henry, Va	75.0	72.8	73.3	71.8	72.0	78.3	74.8	77.6	75.6	72.1	72.6	73.1	74.1
Lynchburg, Va	66.7	60.0	54.7	56.6	60.4	65.8	65.8	72.6	70.4	67.1	65.2	65.1	64.3
Norfolk, Va	73.4	70.5	65.4	66.7	69.8	70.2	69.8	76.2	77.1	73.9	74.1	71.2	71.7
South Atlantic States:													
Cape Hatteras, N. C	79.8	77.5	78.1	78.7	78.1	79.4	80.4	81.0	78.9	76.8	74.9	76.2	78.2
Charlotte, N. C	69.5	61.4	58.6	56.0	63.8	62.2	66.1	77.9	66.4	67.2	71.1	70.1	.....
Kitty Hawk, N. C	78.5	75.3	77.6	76.6	78.9	78.9	80.7	81.5	79.6	78.2	78.0	77.9	78.9
Smithville, N. C	78.6	74.6	75.8	74.9	76.7	76.8	77.4	78.4	77.5	78.7	76.8	76.7	75.9
Wilmington, N. C	71.0	67.0	67.2	66.3	70.6	73.8	75.2	78.5	77.2	74.0	72.0	72.1	72.3
Charleston, S. C	73.2	70.4	68.8	60.5	72.1	73.2	73.6	75.1	75.4	74.4	73.6	72.4	73.1
Augusta, Ga	74.0	67.9	63.2	62.9	64.8	68.8	69.1	78.9	72.5	71.0	72.7	74.8	70.4
Savannah, Ga	71.4	68.3	65.8	64.7	69.2	71.6	73.1	75.7	78.6	74.4	71.8	70.5	71.4
Jacksonville, Fla	73.7	70.3	65.8	65.0	67.5	71.8	71.2	73.8	77.9	73.4	73.5	72.7	71.2
Florida Peninsula:													
Key West, Fla	79.4	77.3	69.6	68.8	70.0	71.1	71.0	71.6	74.4	75.5	77.4	78.2	73.5
Punta Rassa, Fla	77.1	75.5	72.1	70.8	72.0	74.4	76.1	77.0	77.7	73.9	74.9	74.4	74.8
Eastern Gulf States:													
Atlanta, Ga	67.3	57.6	58.0	54.8	57.8	56.4	64.2	73.9	65.4	71.9	65.3	70.3	.....
Mobile, Ala	77.9	72.6	72.9	71.6	70.6	73.0	74.0	77.9	74.9	73.6	74.6	77.6	73.9
Montgomery, Ala	72.4	66.2	64.1	63.8	62.9	68.2	69.3	70.1	69.0	68.1	70.2	72.6	68.0
Vicksburg, Miss	70.9	64.8	64.4	66.4	66.6	70.1	72.4	72.9	71.4	69.6	68.5	69.6	69.0
New Orleans, La	71.0	66.9	69.7	68.0	68.6	71.4	72.8	72.7	71.2	68.2	71.1	72.0	70.3
Western Gulf States:													
Shreveport, La	74.7	68.0	66.3	66.4	68.2	69.6	70.6	70.8	70.8	71.2	70.7	74.1	70.3
Fort Gibson, Ind. T	69.5	65.5	59.8	60.5	67.7	71.1	69.0	67.1	66.5	64.1	63.6	67.9	67.2
Corsicana, Tex	72.2	62.9	60.9	64.8	71.4	70.5	67.3	66.1	64.4	63.2	67.6	66.9	67.0
Denison, Tex	71.2	63.4	59.6	63.4	72.2	72.6	69.5	66.1	66.8	59.3	65.1	66.5	66.7
Galveston, Tex	76.8	76.0	78.9	73.8	74.1	72.2	71.8	73.2	72.5	72,2	76.9	80.4	74.8
Indianola, Tex	81.3	74.9	79.0	73.9	76.9	75.5	73.7	75.1	75.9	74.3	76.9	81.4	77.0
San Antonio, Tex	69.9	62.8	62.0	60.5	67.9	69.4	60.1	65.2	64.8	65.1	68.0	69.2	69.2
Rio Grande Valley:													
Brownsville, Tex	73.6	74.6	75.1	70.9	71.9	68.9	68.8	70.4	75.4	72.4	74.0	76.1	72.0
Rio Grande City, Tex	69.3	64.9	65.7	61.6	62.1	64.0	58.0	67.2	67.8	70.4	66.2	68.5	.....
Ohio Valley and Tennessee:													
Knoxville, Tenn	74.1	68.1	62.3	59.7	62.5	71.4	71.9	74.9	72.1	68.1	71.3	74.7	69.8
Memphis, Tenn	71.8	65.7	60.4	59.7	63.4	68.1	70.3	70.8	69.6	67.6	64.9	69.8	67.0
Nashville, Tenn	72.1	67.5	61.8	59.4	59.6	65.6	66.7	68.6	68.7	66.2	68.7	71.8	66.6
Louisville, Ky	70.2	66 0	61.1	57.6	57.9	62.9	65.8	66.7	66.6	64.2	68.0	70.2	65.4
Indianapolis, Ind	72.2	68.3	67.1	57.6	58.2	66.7	68.8	69.7	68.8	64.9	70.0	73.7	67.5
Cincinnati, Ohio	70.3	68.4	63.9	57.4	56.8	63.4	65.1	67.8	65.6	62.5	67.0	70.7	65.4
Columbus, Ohio	65.0	66.7	64.5	54.0	54.3	60.1	64.5	69.4	70.4	66.0	69.4	73.0	.....

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Ohio Valley and Tennessee—Continued:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Morgantown, W. Va	72.6	68.2	64.2	62.1	61.4	67.6	71.8	73.2	74.3	71.9	72.9	73.0	69.4
Pittsburg, Pa	76.4	73.5	70.6	64.8	60.2	65.8	69.6	70.4	72.5	71.7	72.8	78.4	70.4
Lower Lakes:													
Buffalo, N. Y	79.0	78.0	75.7	71.7	65.4	69.5	71.5	69.5	70.6	71.0	75.9	80.4	73.3
Oswego, N. Y	77.8	75.6	72.9	68.8	63.8	69.1	70.4	70.1	70.7	70.6	72.0	77.2	71.0
Rochester, N. Y	81.4	78.2	76.3	67.5	59.7	65.1	66.6	66.8	69.6	70.9	76.8	81.0	71.9
Erie, Pa	80.6	78.3	77.7	69.7	64.0	69.0	69.9	69.5	72.0	71.5	75.3	80.9	72.0
Cleveland, Ohio	77.7	74.8	77.0	68.1	62.7	67.8	71.0	66.7	70.1	69.3	74.3	78.5	71.8
Sandusky, Ohio	76.0	75.8	76.0	68.0	63.0	68.2	71.6	66.8	72.4	70.6	74.6	77.1	72.8
Toledo, Ohio	74.8	72.8	71.7	63.7	61.8	67.2	69.6	70.4	71.5	69.0	70.8	75.6	70.0
Detroit, Mich	77.6	74.2	73.5	63.6	60.8	67.7	70.2	69.6	72.9	70.5	74.7	77.8	71.2
Upper Lakes:													
Alpena, Mich	76.5	72.1	75.2	69.1	67.4	72.2	71.8	75.7	77.2	77.4	81.5	79.5	74.9
Escanaba, Mich	75.3	71.5	70.8	68.9	68.4	72.2	71.4	74.2	76.8	75.6	79.0	78.6	73.9
Grand Haven, Mich	77.1	74.7	74.9	66.6	65.1	71.1	71.7	73.6	74.6	72.5	74.4	76.8	73.2
Marquette, Mich	75.2	73.0	72.1	67.5	63.6	67.8	66.8	68.4	70.4	70.2	74.3	76.3	70.7
Port Huron, Mich	79.0	77.0	77.5	69.1	65.9	71.1	73.0	71.0	72.6	72.2	77.7	80.9	74.6
Chicago, Ill	76.2	73.3	72.0	66.7	67.0	69.4	70.2	70.3	68.5	68.0	71.0	73.9	71.0
Milwaukee, Wis	79.1	77.0	77.0	71.6	68.6	73.2	74.3	73.6	72.9	71.9	75.3	77.8	75.0
Duluth, Minn	73.4	73.0	69.8	65.6	65.7	71.7	67.7	71.1	73.2	68.3	73.6	74.1	70.2
Upper Mississippi Valley:													
Saint Paul, Minn	71.8	70.6	68.9	57.8	57.6	66.3	67.9	69.9	70.0	69.0	72.6	76.2	68.5
La Crosse, Wis	72.7	71.5	68.5	59.4	60.3	68.8	70.1	66.9	71.9	67.6	73.4	74.4	68.8
Davenport, Iowa	77.9	74.7	71.8	62.1	62.9	69.0	67.7	67.2	69.0	65.5	71.6	77.1	70.3
Des Moines, Iowa	76.3	70.1	67.2	57.8	63.6	69.8	66.1	66.0	65.6	65.6	67.6	74.4	....
Dubuque, Iowa	70.4	69.6	68.7	60.8	60.4	67.7	65.1	67.0	69.9	67.1	73.0	72.1	68.0
Keokuk, Iowa	75.6	72.1	69.0	63.6	64.6	70.2	68.8	67.8	68.6	66.0	70.0	75.4	69.9
Cairo, Ill	71.9	67.2	62.9	61.0	65.6	71.8	70.5	71.6	72.2	67.6	66.5	70.6	68.3
Saint Louis, Mo	67.9	66.8	63.8	56.2	58.4	65.0	65.4	64.7	63.5	59.6	63.9	69.2	64.2
Missouri Valley:													
Leavenworth, Kans	73.6	69.9	64.5	60.7	64.6	67.7	68.2	64.0	64.1	62.6	64.9	71.1	66.8
Omaha, Nebr	74.6	72.9	67.6	60.7	63.7	68.8	71.2	68.2	69.5	63.6	70.1	72.7	69.4
Yankton, Dak	67.6	69.0	69.4	65.0	67.2	71.1	71.4	70.6	66.7	61.4	66.6	69.9	67.8
Extreme Northwest:													
Breckenridge, Minn	77.0	77.7	76.9	72.1	66.3	72.7	72.4	75.8	73.5	68.5	78.8	79.3	74.5
Bismarck, Dak	69.8	72.1	70.0	62.2	62.9	63.3	60.0	59.2	59.2	61.2	69.2	70.1	64.0
Pembina, Dak	83.5	84.9	82.1	72.7	67.3	72.1	71.3	71.8	78.9	74.7	82.8	85.1	76.2
Northern Slope:													
Cheyenne, Wyo	58.8	54.5	55.4	56.0	53.5	44.8	46.6	46.8	44.9	44.9	53.2	57.4	52.2
North Platte, Nebr	69.7	68.1	63.5	58.8	63.8	58.9	63.8	61.8	59.9	58.4	64.2	67.8	63.5
Middle Slope:													
Denver, Colo	52.0	51.5	46.4	48.7	45.2	40.2	44.5	45.2	43.9	40.9	47.1	53.4	46.5
Pike's Peak, Colo	64.0	65.2	71.6	73.6	67.6	61.8	61.7	62.0	63.2	62.1	64.3	64.2	66.0
Dodge City, Kans	71.7	60.8	63.3	58.0	63.2	60.9	62.1	63.2	57.8	57.8	62.4	67.8	63.6
Southern Slope:													
Sill, Fort, Ind. T	65.4	63.4	52.0	55.5	62.4	65.3	63.2	62.1	60.9	58.8	65.2	71.4	62.8
Concho, Fort, Tex	59.4	52.1	51.8	54.0	58.2	55.0	51.2	58.8	58.5	56.6	53.2	49.8	54.8
Davis, Fort, Tex	47.1	45.1	42.7	28.5	36.5	51.4	50.6	54.5	47.3	47.8	42.2	51.9	.
Stockton, Fort, Tex	50.8	45.7	40.5	38.6	43.7	46.0	34.8	33.1	43.0	43.3	53.6	61.9	41.3
Southern Plateau:													
La Mesilla, N. Mex	56.0	47.0	38.2	36.7	27.0	30.5	49.0	49.0	41.3	45.5	48.6	56.6	45.4
Santa Fé, N. Mex	52.2	51.1	38.6	35.0	29.7	30.7	46.3	49.1	42.0	39.4	45.5	50.3	43.4
El Paso, Tex	52.7	56.9	47.6	44.0	40.9	43.8	46.4	51.5	57.4	58.7	58.6	61.3	.....
Apache, Fort, Ariz	62.3	51.3	35.8	30.1	23.2	25.3	52.2	57.4	39.8	40.6	56.2	50.3	.....
Florence, Ariz	50.5	48.0	41.7	40.1	29.0	24.2	35.5	35.2	35.5	39.5	38.4	48.4	41.9
Grant, Fort, Ariz	51.7	44.2	27.7	30.0	23.6	25.4	44.0	49.6	33.9	29.2	40.3	40.6	.....
Prescott, Ariz	51.1	48.6	40.8	41.2	24.2	24.0	34.5	41.8	35.6	35.3	48.0	47.5	42.8
Tucson, Ariz	36.8	45.2	41.2	36.0	30.4	26.8	38.6	43.0	41.7	43.7	34.2	39.0	41.5
Yuma, Ariz	40.4	40.3	37.9	37.1	26.6	28.4	34.0	34.7	35.7	34.7	35.6	42.6	35.3
Middle Plateau:													
Pioche, Nev	64.4	58.6	41.0	43.2	26.6	27.0	16.6	24.7	20.2	30.9	41.0	52.6	41.9
Winnemucca, Nev	62.9	61.0	50.0	48.4	38.6	35.8	21.2	20.8	25.6	40.4	58.5	57.4	44.0
Salt Lake City, Utah	66.7	60.4	49.8	42.5	40.0	32.2	29.8	29.0	30.2	39.5	55.7	67.9	46.7
Northern Plateau:													
Boisé City, Idaho	69.8	67.0	61.2	53.0	52.6	47.6	37.2	37.3	45.8	58.3	64.6	68.4	55.9
Umatilla, Oreg	80.0	75.8	64.4	53.8	53.4	45.1	44.2	38.6	45.7	62.1	76.6	82.4	58.6
North Pacific Coast:													
Olympia, Wash	85.4	85.6	84.8	75.5	71.3	69.2	69.1	73.1	80.4	85.1	85.5	86.7	78.3
Portland, Oreg	75.8	76.7	76.6	68.0	65.9	63.3	63.9	66.6	67.5	75.2	76.6	76.9	70.8
Roseburg, Oreg	82.8	78.6	79.8	73.5	73.3	63.4	66.2	63.2	67.0	78.7	87.3	90.5	74.8

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Middle Pacific Coast:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Red Bluff, Cal	72.6	78.0	71.8	59.8	50.8	33.2	33.0	33.0	34.7	43.3	66.8	62.0	53.2
Sacramento, Cal	74.8	76.8	75.0	66.9	61.3	52.9	51.7	50.7	50.5	53.5	67.2	66.5	62.2
San Francisco, Cal	71.8	72.8	70.5	69.4	71.3	71.9	77.7	79.0	77.2	71.9	72.2	71.5	72.9
South Pacific Coast:													
Campo, Cal	63.8	67.0	68.8	67.7	65.3	58.9	55.8	52.1	48.2	54.0	50.6	56.1	61.9
Los Angeles, Cal	62.8	71.9	72.4	68.2	67.0	69.0	68.1	67.4	69.0	60.2	51.9	52.8	66.0
San Diego, Cal	73.2	76.2	75.4	71.6	73.6	75.3	76.8	77.8	76.9	72.5	60.3	66.3	73.6
Visalia, Cal	73.0	72.5	67.1	62.2	49.6	42.6	41.0	41.9	47.0	59.8	70.2	66.4	61.2
Alaska Stations:													
Saint Michael's, Fort, Alaska	95.8	97.4	97.8	93.8	91.4	82.7	80.4	85.4	85.7	88.4	89.7	94.8	90.8

APPENDIX 37.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Eastport, Me	73.8	74.8	72.5	70.3	74.5	74.0	78.5	78.5	78.2	75.0	73.4	76.3	74.9
Portland, Me	71.1	69.2	65.4	60.0	64.5	66.5	69.6	70.9	72.9	69.6	69.2	72.4	68.4
Mount Washington, N. H	82.1	85.2	88.4	86.5	86.6	81.6	88.1	86.6	85.6	86.6	87.7	84.8	85.7
Boston, Mass	71.9	72.7	71.0	66.4	70.6	69.7	71.9	72.8	74.1	71.1	70.2	72.3	71.3
Block Island, R. I	75.1	77.1	74.4	75.2	82.2	82.8	82.2	82.2	82.6	77.8	76.1	78.7	78.9
New Haven, Conn	73.3	73.1	68.1	64.7	70.1	71.2	73.4	75.1	76.0	73.7	71.0	75.6	72.1
New London, Conn	72.7	74.9	71.3	68.6	72.7	75.1	77.0	78.1	78.9	76.8	72.0	75.1	74.5
Middle Atlantic States:													
Albany, N. Y	69.2	68.3	65.6	56.1	58.8	60.8	63.0	63.9	67.9	65.5	67.1	71.8	64.6
New York City	77.4	77.3	71.8	66.4	70.3	70.6	71.9	72.3	74.1	72.0	71.0	76.8	72.8
Philadelphia, Pa	76.4	72.7	69.5	68.2	74.0	72.8	70.8	73.6	72.7	72.3	69.7	74.9	72.3
Atlantic City, N. J	77.8	78.8	76.0	76.1	80.3	81.0	80.3	81.7	81.3	77.7	76.7	79.0	78.8
Barnegat City, N. J	80.9	80.2	74.1	74.1	79.3	79.4	79.4	81.4	81.7	79.7	76.4	80.4	78.8
Cape May, N. J	79.1	77.2	73.9	74.4	77.9	78.2	77.5	79.5	77.9	75.5	71.6	77.2	76.8
Sandy Hook, N. J	77.4	78.0	74.8	72.2	73.8	78.4	72.6	74.7	75.1	71.9	71.3	75.8	74.6
Delaware Breakwater, Del	83.7	79.9	78.7	76.5	78.6	80.3	79.5	79.8	80.8	78.0	76.6	79.1	80.0
Baltimore, Md	71.0	67.0	63.8	59.7	61.9	65.0	64.6	68.1	69.3	69.1	65.0	68.4	66.1
Washington City	78.5	72.3	68.5	65.4	66.1	69.0	69.4	72.0	73.4	73.1	70.7	75.2	71.3
Cape Henry, Va	79.5	75.1	71.7	70.8	71.6	74.1	75.3	77.7	76.6	74.2	69.6	73.2	74.3
Chincoteague, Va	83.7	80.2	76.0	77.1	81.8	83.0	82.2	83.9	81.8	80.6	77.8	80.1	80.8
Lynchburg, Va	68.6	63.8	58.8	58.8	60.5	66.0	62.8	65.6	67.8	67.8	64.2	67.6	64.2
Norfolk, Va	77.6	71.2	67.3	66.8	67.1	69.3	71.5	75.3	75.7	75.6	70.6	73.2	71.8
South Atlantic States:													
Charlotte, N. C	74.4	67.0	63.6	63.3	61.6	63.5	62.9	67.1	70.7	69.0	67.0	71.2	66.7
Hatteras, N. C	85.8	81.8	77.0	79.9	80.4	82.9	80.8	81.7	81.4	82.2	79.6	81.1	81.4
Kitty Hawk, N. C	82.4	77.7	73.4	75.6	77.4	77.9	77.5	80.8	79.6	78.1	74.8	78.1	77.8
Macon, Fort, N. C	83.6	81.4	75.8	80.6	79.9	83.2	81.3	82.7	82.8	82.8	79.4	80.3	81.1
Smithville, N. C	83.9	80.1	75.5	80.7	77.1	77.4	77.3	80.3	81.0	79.2	77.0	80.2	79.0
Wilmington, N. C	74.9	71.0	67.1	68.7	71.4	73.7	75.9	78.4	75.6	75.8	71.4	73.6	73.1
Charleston, S. C	79.2	74.0	71.0	73.8	73.4	73.8	75.4	77.9	79.5	79.1	75.1	77.7	75.9
Augusta, Ga	73.9	67.5	64.4	65.8	62.9	68.5	67.3	71.4	71.5	71.2	69.6	71.4	68.9
Savannah, Ga	73.0	67.8	62.0	66.5	68.4	70.0	69.8	75.8	76.7	76.2	70.4	71.0	70.6
Jacksonville, Fla	76.6	71.8	65.5	68.5	70.5	71.7	73.2	75.7	77.4	77.1	76.5	76.0	73.4
Florida Peninsula:													
Cedar Keys, Fla	81.4	76.2	73.1	73.6	70.7	74.2	73.6	75.3	75.1	75.9	77.9	81.2	75.7
Key West, Fla	79.6	75.1	70.7	69.4	71.8	71.7	69.4	72.8	75.7	77.4	78.9	79.3	74.8
Sanford, Fla	78.2	75.0	72.9	72.0	70.8	78.6	75.0	78.9	80.9	80.0	79.4	77.8	76.9
Eastern Gulf States:													
Atlanta, Ga	73.7	65.1	62.8	68.0	63.4	68.0	66.4	73.0	70.5	70.1	65.2	69.9	67.4
Pensacola, Fla	78.4	77.2	73.8	77.2	74.7	77.7	78.1	78.7	76.9	76.1	73.8	78.2	76.5
Mobile, Ala	78.9	74.8	70.8	73.0	72.0	74.4	75.9	76.2	74.8	75.6	77.4	79.3	74.4
Montgomery, Ala	74.7	68.6	65.8	67.7	65.8	70.1	68.9	72.5	69.4	68.7	70.8	74.4	69.7
Vicksburg, Miss	72.8	68.5	68.5	66.6	69.7	72.1	73.3	70.8	72.9	75.1	71.6	72.4	70.7
New Orleans, La	73.4	71.1	68.9	71.6	71.4	72.4	72.2	71.9	72.7	74.3	70.8	73.1	71.9
Western Gulf States:													
Shreveport, La	74.6	73.7	66.6	67.6	72.8	70.5	69.9	69.4	70.9	75.0	74.0	72.1	71.5
Fort Smith, Ark	71.8	72.6	61.6	64.4	68.1	73.8	73.3	72.9	71.5	76.8	69.6	72.2	70.8
Little Rock, Ark	75.0	73.1	65.4	68.8	75.8	76.1	76.4	74.8	76.6	79.1	74.2	73.4	74.0
Galveston, Tex	82.5	80.6	78.3	77.9	76.4	74.1	73.8	73.8	74.1	75.9	77.3	79.6	77.0
Indianola, Tex	82.0	80.6	80.1	79.4	79.2	77.1	78.3	77.5	78.6	78.9	78.8	81.6	79.4
Palestine, Tex	68.6	70.4	65.1	71.4	75.4	74.6	74.0	69.8	69.3	74.8	70.2	68.2	70.8
Rio Grande Valley:													
Brownsville, Tex	82.0	81.1	80.6	77.8	78.3	77.1	77.1	76.8	79.0	81.2	80.4	82.9	79.8
Rio Grande City, Tex	72.0	65.4	71.9	68.7	70.5	68.6	60.4	67.0	67.2	73.1	65.4	69.2	68.0
Ohio Valley and Tennessee:													
Chattanooga, Tenn	74.7	67.7	63.7	64.5	68.3	72.9	71.3	75.9	70.6	75.9	70.4	72.2	71.1
Knoxville, Tenn	79.4	70.2	66.4	63.5	66.1	72.6	73.7	74.6	72.9	75.5	71.1	76.2	71.9
Memphis, Tenn	76.5	72.1	63.7	64.0	67.3	77.1	69.4	70.4	71.6	76.2	72.0	74.0	70.8

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Ohio Valley and Tennessee—Continued:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Nashville, Tenn	77.6	71.5	68.1	67.0	65.8	70.0	70.1	69.7	71.7	73.6	71.5	75.7	71.1
Louisville, Ky	74.1	68.2	63.6	60.6	66.7	71.4	67.3	67.5	70.4	74.0	67.1	71.4	69.0
Indianapolis, Ind	73.0	71.8	65.6	61.5	61.7	67.8	65.3	64.4	66.5	71.9	70.2	74.4	68.0
Cincinnati, Ohio	74.6	70.7	64.7	62.5	62.9	67.6	62.8	63.2	65.8	70.8	70.4	74.2	67.7
Columbus, Ohio	74.4	71.1	65.7	62.7	63.1	66.4	62.4	64.2	67.5	71.3	69.6	74.6	67.7
Pittsburg, Pa	78.2	78.4	68.8	62.5	63.6	68.3	68.1	68.8	68.6	71.6	70.9	77.7	70.0
Lower Lakes:													
Buffalo, N. Y	80.6	78.6	75.9	71.7	71.2	73.0	72.6	70.2	73.5	74.1	75.2	78.2	74.7
Oswego, N. Y	70.5	72.5	73.4	68.0	70.4	72.5	72.8	71.4	72.0	70.9	69.9	73.0	71.3
Rochester, N. Y	79.6	78.8	76.7	67.6	67.6	67.9	68.5	68.4	69.8	73.3	75.5	80.6	72.6
Erie, Pa	78.8	76.8	75.3	69.8	67.6	70.3	70.2	69.9	71.7	73.0	73.6	78.2	73.0
Cleveland, Ohio	80.0	77.0	75.0	67.1	66.0	69.0	68.4	69.4	69.2	69.5	72.8	80.0	71.9
Sandusky, Ohio	76.1	74.0	73.0	67.6	67.8	69.4	67.4	69.3	70.4	72.4	71.7	76.0	71.1
Toledo, Ohio	76.2	73.4	68.5	64.6	64.9	69.2	66.5	70.1	70.6	71.9	71.6	75.8	70.1
Detroit, Mich	77.4	76.8	73.3	64.0	65.3	68.9	67.9	70.4	71.5	71.2	71.5	77.2	71.1
Upper Lakes:													
Alpena, Mich	76.5	76.6	76.1	69.1	70.6	74.0	73.5	76.0	77.1	76.1	80.7	79.9	75.5
Escanaba, Mich	75.4	73.8	72.0	67.8	67.6	72.4	72.5	77.2	77.5	76.0	76.8	78.3	74.1
Grand Haven, Mich	80.4	80.5	77.1	68.0	68.5	73.5	75.1	77.2	75.9	76.4	77.1	80.9	75.8
Mackinaw City, Mich	74.3	73.6	69.9	69.0	70.8	75.4	74.1	75.0	77.2	73.2	77.5	80.3	74.2
Marquette, Mich	68.1	68.0	67.6	64.4	62.7	68.0	67.6	73.1	72.6	70.2	72.9	72.7	68.8
Port Huron, Mich	81.9	80.8	78.6	73.2	70.2	74.3	74.9	74.9	75.5	77.5	81.3	83.4	77.3
Chicago, Ill	78.1	70.0	68.9	66.7	67.7	73.4	70.3	69.9	69.2	72.5	71.4	74.8	70.8
Milwaukee, Wis	79.8	78.1	75.6	69.2	68.6	74.6	73.5	76.1	75.6	74.1	75.1	79.6	75.0
Duluth, Minn	77.2	78.8	71.6	69.9	71.2	74.7	69.1	76.8	74.9	73.7	77.9	78.0	74.2
Upper Mississippi Valley:													
Saint Paul, Minn	77.1	71.5	68.9	62.2	64.3	71.2	72.7	74.5	73.1	70.7	71.0	72.7	70.9
La Crosse, Wis	72.0	70.0	69.4	63.1	57.9	65.9	67.9	70.1	71.7	68.6	70.2	72.1	68.3
Davenport, Iowa	65.8	66.7	64.7	63.2	63.8	72.6	69.7	68.4	69.0	70.7	67.0	68.8	67.5
Des Moines, Iowa	68.5	68.3	67.3	63.3	66.6	73.4	72.6	70.8	70.5	71.6	69.1	71.4	69.5
Dubuque, Iowa	66.1	66.5	65.5	59.1	61.5	70.0	68.4	69.5	70.6	70.5	67.8	68.5	66.9
Keokuk, Iowa	74.9	71.5	69.1	64.5	66.2	72.5	68.6	66.9	67.5	72.6	70.7	75.4	70.2
Cairo, Ill	77.5	73.2	67.1	64.3	69.6	74.3	73.2	72.0	74.1	76.2	71.6	74.9	72.4
Springfield, Ill	71.3	68.9	64.8	61.7	65.5	71.6	66.8	65.2	66.0	71.0	67.0	70.8	67.7
Saint Louis, Mo	76.9	76.2	72.4	67.7	73.0	75.2	69.9	69.6	68.1	76.0	72.6	76.7	73.0
Missouri Valley:													
Leavenworth, Kans	70.7	67.6	63.6	59.9	64.2	68.8	66.7	66.5	65.2	69.8	67.6	71.1	66.8
Omaha, Nebr	71.1	69.7	67.1	62.2	65.9	69.7	68.8	70.1	69.3	69.9	67.7	72.0	68.7
Bennett, Fort, Dak	71.5	72.4	72.6	68.0	67.8	70.0	68.5	63.4	62.2	65.3	70.9	74.1	69.2
Huron, Dak	64.2	67.0	70.4	70.3	71.2	73.3	76.4	75.3	71.5	69.9	70.2	66.4	70.1
Yankton, Dak	66.2	68.1	66.9	65.3	65.6	70.8	70.6	69.4	67.8	69.3	66.7	69.5	68.3
Extreme Northwest:													
Moorhead, Minn	83.7	81.2	80.3	73.1	66.7	69.2	71.6	72.8	72.7	74.8	79.4	81.8	75.6
Saint Vincent, Minn	92.8	85.3	85.1	77.5	69.2	73.5	77.5	80.2	77.8	78.8	82.5	86.9	80.6
Bismarck, Dak	83.5	82.2	78.9	71.8	61.9	70.1	67.0	65.7	67.4	70.5	77.8	79.9	72.8
Buford, Fort, Dak	75.4	75.2	77.9	70.4	62.7	66.9	66.8	62.4	64.4	68.4	75.4	75.9	70.3
Northern Slope:													
Assinaboine, Fort, Mont	65.0	67.0	66.7	59.0	54.8	55.8	52.4	51.7	57.5	63.0	64.5	62.8	60.0
Benton, Fort, Mont	69.7	73.3	65.9	63.6	64.0	59.8	49.3	48.9	57.4	61.8	60.5	62.1	61.4
Custer, Fort, Mont	78.8	73.0	68.4	61.2	66.0	65.0	51.3	44.4	53.1	60.9	63.9	69.1	62.3
Helena, Mont	76.2	71.6	68.6	61.9	55.9	57.3	51.8	45.5	54.3	63.4	63.3	63.6	62.4
Maginnis, Fort, Mont	53.3	48.0	47.2	49.8	53.2	49.0	47.4	47.2	53.9	60.4	52.5	52.4	51.1
Shaw, Fort, Mont	71.8	69.0	62.0	58.9	55.7	57.8	52.2	51.9	58.7	63.7	62.1	63.1	60.6
Deadwood, Dak	69.2	68.3	69.0	70.2	66.7	65.9	64.2	60.0	60.3	61.9	64.6	67.3	66.0
Cheyenne, Wyo	51.8	52.4	48.9	52.8	58.5	51.2	49.2	51.4	41.5	50.6	48.9	54.0	50.7
North Platte, Nebr	69.1	66.1	64.4	60.6	65.3	68.4	67.4	64.9	62.9	66.6	62.3	70.6	65.9
Middle Slope:													
Denver, Colo	53.6	55.8	49.5	50.0	58.5	47.9	47.3	49.4	48.6	51.5	53.3	58.4	51.2
Pike's Peak, Colo	71.8	72.5	74.2	77.7	77.0	68.8	69.2	78.4	71.9	75.3	68.1	74.9	73.3
West Las Animas, Colo	66.8	68.8	47.7	47.6	54.9	55.6	49.5	53.6	47.5	55.8	57.8	66.7	57.1
Dodge City, Kans	68.4	61.9	55.7	50.3	65.1	63.8	63.8	66.4	59.9	69.0	61.7	65.7	62.6
Elliott, Fort, Tex	47.3	52.5	45.4	45.5	55.2	52.4	52.9	54.8	54.1	63.5	53.2	51.8	52.7
Southern Slope:													
Sill, Fort, Ind. T	66.0	65.1	63.2	54.1	67.8	65.1	63.4	61.3	64.9	71.5	67.3	68.2	64.9
Concho, Fort, Tex	69.8	68.0	60.6	58.1	68.7	60.1	61.1	62.8	70.5	75.8	69.7	69.7	66.3
Davis, Fort, Tex	58.2	50.3	47.0	43.8	49.9	47.2	55.6	59.5	66.0	58.9	58.6	55.8	55.5
Stockton, Fort, Tex	57.3	54.9	53.9	49.8	62.6	59.0	62.9	66.0	71.7	71.5	60.9	58.1	61.9
Southern Plateau:													
Santa Fé, N. Mex	56.8	53.4	45.0	36.8	32.6	28.9	46.7	55.3	47.2	48.6	55.7	56.0	44.7
El Paso, Tex	52.0	49.5	37.7	31.5	32.4	34.2	45.9	53.7	54.2	55.8	50.6	55.6	48.9
Apache, Fort, Ariz	61.0	62.1	60.4	48.0	42.1	37.5	57.0	67.1	57.4	56.4	55.0	62.3	55.7
Grant, Fort, Ariz	49.0	48.8	42.9	20.1	23.7	25.0	47.1	57.6	44.6	42.3	41.6	50.2	42.1
Prescott, Ariz	56.4	58.0	53.3	44.0	36.2	31.6	52.3	59.5	48.6	48.7	50.7	61.0	50.2
Thomas, Camp, Ariz	65.4	63.5	56.5	39.9	35.5	34.2	47.1	55.9	50.1	49.8	56.2	60.0	52.1
Yuma, Ariz	45.4	45.6	44.9	41.9	38.1	40.0	48.8	48.2	44.8	40.2	48.0	50.9	43.4

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Middle Plateau:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Winnemucca, Nev	62.4	63.2	54.0	51.5	41.0	31.6	24.4	20.6	30.6	48.7	57.1	66.5	48.6
Salt Lake City, Utah	52.1	54.1	48.4	50.7	41.2	33.0	30.5	34.0	35.5	46.6	48.6	53.4	44.0
Northern Plateau:													
Boisé City, Idaho	78.2	76.7	67.3	64.0	56.6	49.6	44.2	43.3	51.8	64.9	70.6	79.0	61.4
Lewiston, Idaho	68.5	67.8	62.8	62.4	59.6	60.2	44.4	43.1	58.4	67.9	74.4	75.9	61.7
Dayton, Wash	81.0	76.4	70.0	65.6	61.3	59.1	52.5	50.6	58.0	69.5	80.5	81.8	67.3
Spokane Falls, Wash	81.6	80.8	75.4	66.5	58.4	58.7	51.1	50.4	62.0	75.4	79.4	78.3	68.4
North Pacific Coast:													
Canby, Fort, Wash	81.8	78.7	88.2	85.1	81.3	86.9	88.9	82.9	86.7	87.6	88.6	86.8	84.5
Olympia, Wash	84.6	83.3	80.9	79.0	72.7	70.6	67.6	71.0	78.9	83.2	85.9	85.4	78.5
Tatoosh Island, Wash	84.7	81.4	81.0	88.0	88.5	87.1	89.2	92.2	89.3	88.8	90.2	83.1	85.6
Portland, Oreg	81.3	79.4	74.5	70.5	63.5	66.5	64.9	67.9	73.8	82.4	80.5	81.4	74.0
Roseburg, Oreg	83.2	80.3	78.6	71.4	64.0	64.9	60.0	61.9	66.2	79.0	84.6	84.5	72.3
Middle Pacific Coast:													
Cape Mendocino, Cal	79.7	77.6	82.0	84.6	85.3	83.7	88.7	87.6	79.1	82.3	79.6	79.4	82.4
Red Bluff, Cal	71.5	68.6	59.0	65.6	52.4	42.2	34.0	35.3	45.3	55.3	62.1	77.6	55.8
Sacramento, Cal	78.9	74.7	68.4	70.7	64.1	61.6	56.8	58.3	57.9	66.6	69.4	83.1	67.4
San Francisco, Cal	75.6	73.5	73.6	77.0	78.8	78.0	79.5	82.0	78.7	77.0	72.1	79.9	76.8
South Pacific Coast:													
Los Angeles, Cal	62.7	65.0	72.5	72.7	71.3	70.4	70.8	70.6	68.9	67.9	61.4	67.1	68.2
San Diego, Cal	65.6	68.5	74.8	74.0	73.3	74.5	75.6	76.5	75.3	71.2	64.6	69.6	71.9
Alaska Stations:													
Saint Michael's, Ft., Alaska	97.5	97.7	96.4	95.4	92.9	85.1	83.2	86.7	87.9	89.5	93.0	94.0	91.4
Sitka, Alaska	75.2	74.5	71.8	68.6	74.9	77.0	79.5	79.6	81.4	75.2	77.6	75.8	75.3
Unalashka, Alaska	86.2	85.9	82.8	80.3	77.7	78.0	77.8	81.3	77.8	79.0	80.0	81.4	79.5
Behring's Island, Behring Sea	88.8	84.3	87.4	90.1	88.5	87.6	91.6	92.6	85.2	85.2	88.0	86.4	87.7

APPENDIX 38.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, computed from the 7 *a. m.*, 3 *and* 11 *p. m. (Washington time) observations, and from January* 1, 1882, *to December* 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
New England:													
Eastport, Me	74.3	75.6	72.7	73.5	73.8	73.4	79.3	76.8	76.3	74.7	74.6	77.1	75.1
Portland, Me	71.7	69.3	63.2	61.9	63.2	66.2	69.6	71.0	71.9	70.3	68.8	73.7	68.4
Mount Washington, N. H.	83.3	87.2	89.2	89.6	89.8	83.5	92.4	89.5	87.7	88.0	87.0	86.2	87.8
Boston, Mass	73.2	74.7	69.9	72.0	72.2	70.4	71.1	72.4	74.3	73.4	70.8	73.8	72.4
Block Island, R. I	76.4	77.8	73.7	78.6	82.1	83.3	82.1	82.1	82.3	78.9	77.1	80.1	79.5
New Haven, Conn	73.5	74.1	67.6	67.1	69.0	70.9	72.9	74.1	75.3	74.4	70.9	75.9	72.1
New London, Conn	73.0	76.7	71.7	70.2	70.9	74.9	75.9	77.4	78.6	79.2	72.7	74.4	74.7
Middle Atlantic States:													
Albany, N. Y	65.2	65.7	63.0	56.9	57.5	60.5	63.8	62.7	67.4	65.8	63.6	69.1	63.4
New York City	78.0	78.2	71.2	68.1	69.3	70.8	71.5	71.1	73.5	72.6	71.7	76.3	72.7
Philadelphia, Pa	76.6	73.2	69.0	73.9	78.9	75.4	73.5	76.8	74.9	74.0	69.2	73.7	74.1
Atlantic City, N. J	75.7	78.9	76.1	77.6	78.4	81.1	79.1	80.7	80.1	79.6	76.5	77.7	78.5
Barnegat City, N. J	80.3	82.0	73.8	74.4	78.1	79.7	79.8	81.1	81.7	81.2	77.0	78.6	78.9
Cape May, N. J	78.8	77.4	76.0	77.1	77.2	79.6	80.5	79.9	78.5	76.9	73.2	77.9	77.8
Sandy Hook, N. J	77.8	79.7	74.9	74.2	72.9	73.8	71.9	74.0	74.9	73.3	73.0	76.9	74.7
Delaware Breakwater, Del.	84.6	82.2	79.3	79.5	78.5	81.5	79.8	78.9	80.5	79.7	77.1	79.2	80.1
Baltimore, Md	70.7	67.3	63.0	61.5	62.3	64.8	65.8	69.3	69.8	70.3	64.1	67.2	66.3
Washington City	80.1	74.9	69.4	68.1	67.3	68.7	69.4	72.7	73.8	74.4	70.9	75.4	72.1
Cape Henry, Va	81.3	77.3	72.9	74.7	72.8	76.4	76.8	78.9	78.2	77.0	70.9	75.0	76.1
Chincoteague, Va	83.8	80.0	76.3	77.4	79.2	83.6	82.2	83.4	81.4	81.4	76.9	78.8	80.4
Lynchburg, Va	67.2	63.2	57.9	63.4	62.1	68.0	63.7	67.4	68.9	70.0	62.2	66.2	65.0
Norfolk, Va	75.6	71.4	66.8	69.8	69.4	71.6	74.1	76.6	77.4	78.7	70.6	72.2	72.9
South Atlantic States:													
Charlotte, N. C	76.7	71.8	63.9	64.7	62.6	67.1	64.1	68.1	72.0	71.5	64.9	70.1	68.1
Hatteras, N. C	85.6	81.1	77.8	80.0	80.1	82.9	81.4	82.9	82.1	84.3	79.6	82.9	81.7
Kitty Hawk, N. C	81.5	77.7	73.5	78.1	78.1	79.6	78.4	81.0	80.2	80.6	74.7	76.7	78.4
Macon, Fort, N. C	83.5	82.2	76.6	81.4	79.7	83.2	81.1	83.4	83.4	83.7	79.0	79.9	81.4
Smithville, N. C	83.0	81.2	76.3	79.7	76.8	79.0	77.9	81.2	82.1	80.2	74.6	78.7	79.2
Wilmington, N. C	75.0	71.8	67.6	70.5	70.8	75.1	77.1	78.4	79.7	77.0	68.3	72.4	73.6
Charleston, S. C	79.9	78.0	74.5	76.5	78.8	77.5	77.8	79.6	82.1	80.8	75.0	80.0	78.0
Augusta, Ga	71.9	68.5	63.4	66.5	65.3	72.6	69.2	71.1	72.0	70.2	67.0	71.2	69.1
Savannah, Ga	71.1	68.9	61.9	67.2	66.2	72.6	70.4	74.8	76.1	75.3	66.9	69.9	70.1
Jacksonville, Fla	77.1	74.1	68.1	72.1	69.6	75.2	74.7	77.1	78.7	78.5	77.2	79.8	75.2
Florida Peninsula:													
Cedar Keys, Fla	81.1	75.1	74.5	73.5	69.7	75.4	74.6	75.5	74.1	76.7	76.6	81.8	75.7
Key West, Fla	79.6	75.9	71.7	70.2	69.6	71.7	70.1	72.1	75.9	79.0	80.5	82.0	74.9
Eastern Gulf States:													
Atlanta, Ga	75.6	69.5	64.2	64.0	62.6	71.7	68.4	73.6	68.1	70.3	62.4	69.7	68.3
Pensacola, Fla	77.3	79.0	75.8	76.4	74.3	79.7	79.3	79.2	76.0	74.8	69.0	77.2	76.5
Mobile, Ala	78.5	75.5	72.7	72.5	70.9	74.7	76.4	75.4	73.2	74.1	76.9	78.7	75.0
Montgomery, Ala	74.2	69.3	65.8	67.3	63.7	72.4	71.4	73.4	67.1	66.7	69.4	73.9	69.6
Vicksburg, Miss	73.4	68.3	62.7	67.8	69.8	73.2	74.4	73.2	71.6	74.0	69.9	70.8	70.8
New Orleans, La	73.4	71.9	69.4	71.3	70.4	74.0	71.7	71.8	70.9	73.9	68.2	72.2	71.6
Western Gulf States:													
Shreveport, La	75.3	74.1	65.7	69.6	72.1	71.4	69.0	70.8	68.3	74.1	74.2	71.3	71.4
Little Rock, Ark	78.7	75.1	65.1	70.1	74.3	76.9	77.9	76.9	77.7	80.7	74.5	73.0	74.7
Galveston, Tex	84.1	81.9	79.6	77.9	75.8	75.5	75.0	74.1	73.3	77.3	75.8	79.4	77.5
Indianola, Tex	83.2	81.9	81.8	80.5	78.8	79.5	79.2	77.8	79.3	80.8	78.6	82.2	80.3
Rio Grande Valley:													
Brownsville, Tex	81.0	80.3	81.9	78.7	79.2	79.6	78.7	75.6	78.9	81.0	79.8	79.2	79.8
Ohio Valley and Tennessee:													
Chattanooga, Tenn	74.3	70.6	63.2	65.4	67.3	74.2	72.6	78.1	77.3	76.3	69.6	70.4	71.6
Knoxville, Tenn	80.9	78.8	66.9	65.1	67.7	74.4	75.4	75.4	73.0	76.6	71.5	76.1	73.1
Memphis, Tenn	78.0	74.9	64.3	65.3	67.5	73.1	71.1	72.6	71.6	76.5	72.2	73.0	71.7
Nashville, Tenn	79.2	78.3	66.9	66.3	66.4	73.3	73.9	74.1	72.1	74.5	73.5	76.5	72.5
Louisville, Ky	74.3	69.8	63.3	60.9	69.8	73.9	70.4	70.1	71.4	74.7	69.5	71.5	70.5
Indianapolis, Ind	72.6	72.5	64.2	61.0	63.2	66.8	65.9	67.2	67.7	71.8	70.5	75.8	68.3
Cincinnati, Ohio	78.0	75.2	66.8	64.6	67.3	68.0	63.5	64.1	66.7	71.3	73.0	75.8	69.3
Columbus, Ohio	74.1	72.0	65.4	64.0	65.4	68.1	64.0	65.5	68.7	72.1	70.4	74.2	68.7
Pittsburg, Pa	79.0	74.7	68.8	62.5	65.6	68.2	68.3	70.3	69.9	71.8	70.5	79.1	70.7
Lower Lakes:													
Buffalo, N. Y	83.7	81.8	76.0	73.4	72.4	72.4	74.9	72.1	76.5	75.9	76.7	78.0	76.2
Oswego, N. Y	67.7	71.4	71.9	69.1	69.8	72.8	73.4	71.3	73.3	70.9	70.0	73.9	71.3

Mean relative humidity at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Lower Lakes—Continued:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Erie, Pa	80.0	79.1	74.6	71.3	69.7	70.5	72.1	71.6	72.7	74.8	74.0	78.6	74.1
Cleveland, Ohio	80.6	78.9	74.2	66.3	67.2	67.8	67.0	69.8	69.6	68.7	72.0	80.2	71.9
Toledo, Ohio	74.0	73.1	66.5	62.6	66.2	68.5	65.2	69.6	70.2	70.5	68.7	73.5	69.0
Detroit, Mich	75.8	76.1	73.3	64.2	66.4	69.3	67.9	70.1	71.6	70.1	71.3	75.6	71.0
Upper Lakes:													
Alpena, Mich	75.6	75.5	74.6	68.3	69.1	74.7	78.5	76.9	76.6	75.7	81.9	80.7	75.2
Escanaba, Mich	77.1	75.2	73.0	68.6	66.9	71.8	73.1	77.6	78.2	74.8	75.4	77.5	74.1
Grand Haven, Mich	80.8	80.6	77.7	65.3	67.9	73.2	74.8	78.1	75.9	75.4	76.1	81.0	75.6
Marquette, Mich	67.1	67.7	67.2	66.6	62.5	66.4	69.1	73.2	72.4	69.5	71.3	78.3	68.8
Port Huron, Mich	83.5	83.4	80.2	75.6	73.9	75.0	76.0	76.4	76.3	76.9	82.4	84.5	78.7
Chicago, Ill	74.6	71.6	69.1	68.0	68.7	74.7	69.3	71.3	69.0	72.5	72.4	74.8	71.4
Milwaukee, Wis	79.6	78.1	75.7	70.3	69.7	76.4	73.4	76.9	76.5	73.6	74.6	80.2	75.4
Duluth, Minn	76.8	72.5	70.6	68.6	66.6	72.3	70.7	77.1	75.6	73.6	75.6	77.0	73.0
Upper Mississippi Valley:													
Saint Paul, Minn	79.6	72.3	69.1	62.2	63.6	71.7	72.6	72.4	72.0	70.6	70.9	73.0	70.8
La Crosse, Wis	72.7	68.5	67.8	57.0	56.4	63.2	66.2	70.3	72.3	69.1	71.0	73.5	67.3
Davenport, Iowa	60.3	63.0	61.7	61.7	67.0	73.9	70.7	71.2	70.4	72.1	68.1	68.4	67.4
Des Moines, Iowa	66.2	66.5	66.7	62.8	68.2	73.6	72.7	72.3	69.6	71.9	67.9	69.6	69.0
Dubuque, Iowa	60.0	63.0	64.1	57.9	63.1	70.0	67.7	69.8	70.3	70.0	66.9	65.8	65.7
Keokuk, Iowa	76.1	72.8	69.9	64.6	68.1	74.0	69.7	70.7	68.9	72.9	72.1	76.0	71.4
Cairo, Ill	79.4	76.1	68.8	65.9	69.4	76.8	76.2	74.9	75.1	77.0	72.2	74.6	73.9
Springfield, Ill	72.0	71.0	65.1	61.6	66.3	73.7	67.9	69.1	66.5	71.2	67.2	72.1	68.6
Saint Louis, Mo	78.3	79.4	75.6	71.5	77.9	79.1	75.1	77.1	71.2	79.3	76.3	77.5	76.5
Missouri Valley:													
Leavenworth, Kans	71.1	67.0	63.4	61.0	64.7	70.3	68.7	71.0	65.0	70.6	68.6	74.4	68.0
Omaha, Nebr	68.7	67.4	65.9	63.8	68.3	71.4	70.9	73.9	70.8	69.8	68.7	71.1	69.3
Bennett, Fort, Dak	73.9	73.4	73.3	68.2	69.3	69.8	68.9	64.0	60.0	65.4	70.2	77.3	69.5
Huron, Dak	64.2	67.0	70.4	70.3	71.2	73.3	75.5	74.3	69.5	68.9	69.0	67.0	70.1
Yankton, Dak	66.2	67.8	68.0	66.9	67.1	70.8	71.3	71.5	67.4	68.0	69.2	70.7	68.7
Extreme Northwest:													
Moorhead, Minn	88.8	83.4	82.5	73.2	65.7	67.7	72.6	71.7	71.2	74.6	77.9	83.3	76.1
Saint Vincent, Minn	92.2	83.4	84.7	77.9	69.3	73.2	79.1	81.1	77.5	79.6	80.9	86.8	80.5
Bismarck, Dak	80.7	79.5	76.7	71.3	63.0	69.9	69.3	67.1	67.3	73.2	80.4	76.8	72.9
Buford, Fort, Dak	78.1	73.1	76.4	69.8	62.6	65.0	66.0	61.3	62.9	71.6	77.7	78.8	70.3
Northern Slope:													
Assinaboine, Fort, Mont	64.9	66.0	68.3	61.8	58.0	55.8	51.9	50.9	57.1	60.4	61.2	60.5	60.0
Benton, Fort, Mont	62.9	67.1	67.2	59.7	60.5	60.3	49.8	48.8	59.8	60.6	56.6	62.5	59.7
Helena, Mont	78.5	75.2	68.7	65.4	58.2	58.7	54.0	44.7	54.3	64.0	66.8	71.0	62.9
Shaw, Fort, Mont	67.4	67.9	63.9	61.1	59.6	58.4	50.7	50.5	59.9	62.8	59.0	61.8	60.2
Deadwood, Dak	76.9	74.6	75.8	77.9	75.5	71.4	69.1	64.6	62.6	64.2	66.9	74.5	61.2
Cheyenne, Wyo	53.0	52.8	49.0	57.4	59.5	59.1	47.7	50.3	40.6	51.2	45.9	59.6	52.2
North Platte, Nebr	72.6	69.8	64.9	66.2	69.5	70.8	67.7	68.8	63.5	66.3	62.5	72.3	67.9
Middle Slope:													
Denver, Colo	55.6	56.5	49.8	54.3	58.1	55.0	46.9	48.1	42.7	50.6	48.0	58.8	52.0
Pike's Peak, Colo	79.1	79.2	79.7	82.8	86.1	80.9	69.5	74.4	75.9	81.5	73.0	81.7	78.6
Dodge City, Kans	68.6	65.7	57.5	57.1	66.0	69.8	63.3	69.0	61.2	67.3	62.8	69.0	64.8
Elliott, Fort, Tex	54.3	54.5	52.0	50.3	59.5	63.9	59.5	68.6	60.6	69.6	61.8	65.0	59.6
Southern Slope:													
Concho, Fort, Tex	71.3	73.8	66.6	57.5	63.9	64.5	59.7	60.9	68.7	75.2	72.8	70.3	67.1
Davis, Fort, Tex	55.9	52.4	50.5	44.2	44.4	50.0	53.2	59.7	62.5	61.1	62.2	57.9	54.5
Stockton, Fort, Tex	65.8	63.4	58.5	50.7	61.0	62.9	60.5	64.2	70.1	69.7	68.4	63.1	63.2
Southern Plateau:													
El Paso, Tex	58.4	52.2	41.4	30.8	29.4	33.4	42.0	51.2	54.3	54.9	59.4	55.9	46.5
Apache, Fort, Ariz	67.3	67.2	65.1	51.0	48.1	44.9	54.5	65.6	56.9	55.0	58.9	67.7	58.5
Grant, Fort, Ariz	53.5	59.4	47.8	32.5	29.7	30.8	42.4	56.1	42.7	44.2	46.7	56.1	45.2
Prescott, Ariz	57.4	63.7	59.0	48.0	42.2	38.5	53.1	58.7	47.3	51.5	54.3	68.8	53.1
Thomas, Camp, Ariz	67.3	68.7	59.4	41.9	39.3	35.3	40.8	51.9	46.5	46.8	59.4	67.9	52.1
Middle Plateau:													
Salt Lake City, Utah	55.0	54.2	51.4	54.3	43.1	36.7	31.6	36.8	39.6	54.1	51.9	58.4	47.3
Northern Plateau:													
Lewiston, Idaho	71.1	68.9	65.8	61.4	56.8	53.2	44.1	43.2	55.2	70.4	75.6	77.5	61.9
Dayton, Wash	81.3	75.2	72.3	65.8	59.8	58.7	50.5	48.4	57.0	71.2	81.5	83.2	67.1
Spokane Falls, Wash	81.6	79.0	77.1	69.2	61.5	58.0	49.8	48.2	60.4	75.0	80.2	80.3	68.4
North Pacific Coast:													
Olympia, Wash	83.4	80.8	80.2	79.7	72.7	69.0	65.8	68.6	78.1	83.2	85.1	84.1	77.5
Portland, Oreg	81.6	77.6	74.5	71.1	63.7	65.5	65.5	66.6	74.8	82.8	82.8	81.9	74.0
Middle Pacific Coast:													
Red Bluff, Cal	71.9	68.4	65.1	63.3	53.0	45.6	34.7	35.4	49.2	59.7	69.7	73.6	57.5
Sacramento, Cal	77.7	74.0	70.6	68.3	65.1	62.9	57.2	58.6	60.1	71.6	75.7	80.7	68.6
San Francisco, Cal	76.0	71.6	75.7	75.6	74.7	78.3	79.5	83.1	78.8	79.7	79.7	77.8	77.5
South Pacific Coast:													
Los Angeles, Cal	61.5	65.1	73.8	73.2	71.2	72.2	70.8	70.0	68.8	68.0	68.2	65.3	68.6
San Diego, Cal	64.3	67.7	75.0	74.1	73.6	75.1	76.0	77.1	75.1	71.9	69.8	68.8	72.4
Alaska Stations:													
Saint Michael's, Ft., Alaska	96.1	96.5	95.2	93.6	90.0	83.5	83.6	85.7	87.4	89.0	92.6	92.5	90.5
Sitka, Alaska	75.2	74.5	71.3	67.1	73.1	75.9	79.0	80.8	80.7	75.7	76.0	74.3	75.8

APPENDIX 39.

Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from January, 1882, *to and including December,* 1884.)

[The daily means are obtained by dividing the sum of 7 a. m., 3 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
	°	°	°	°	°	°	°	°	°	°	°	°	°
New England:													
Eastport, Me	11.2	16.0	19.2	29.6	87.2	47.7	53.1	53.4	48.0	38.4	29.4	18.6	33.5
Portland, Me	14.8	19.3	21.1	81.4	40.1	53.4	58.4	57.8	51.7	40.8	30.3	21.5	36.7
Mount Washington, N. H	—0.4	5.5	5.5	18.0	28.2	40.4	43.7	43.3	37.0	27.0	14.0	7.9	22.5
Boston, Mass	17.8	22.7	24.1	83.5	43.0	55.9	59.3	58.2	53.4	42.3	31.1	23.1	38.6
Block Island, R. I	23.9	27.6	27.7	36.2	45.8	57.7	62.6	62.2	58.1	48.1	37.6	29.8	43.1
New Haven, Conn	16.8	22.3	23.0	32.7	43.2	56.2	60.2	59.2	54.9	43.7	30.9	22.9	38.8
New London, Conn	19.5	25.7	26.7	35.2	44.8	57.2	61.4	61.0	56.9	47.3	33.8	24.9	41.2
Middle Atlantic States:													
Albany, N. Y	14.5	21.0	21.2	31.7	41.9	55.6	58.6	57.5	52.8	40.6	29.3	20.9	37.3
New York City	21.8	27.6	27.9	35.6	45.9	57.9	61.6	60.4	56.9	46.4	34.1	26.5	41.9
Philadelphia, Pa	23.5	30.5	31.0	40.6	53.1	63.2	65.3	64.3	59.0	48.6	34.8	27.9	45.2
Atlantic City, N. J	23.9	30.5	30.9	30.3	48.8	60.5	64.9	64.9	61.2	51.5	37.2	29.5	45.3
Barnegat City, N. J	25.2	31.2	30.1	37.9	48.5	59.9	64.7	64.8	61.3	51.8	38.1	30.4	45.3
Cape May, N. J	27.8	83.3	84.0	41.6	50.7	61.5	66.6	65.7	61.7	52.8	39.6	33.0	47.3
Sandy Hook, N. J	23.0	29.1	29.9	38.3	47.7	59.8	63.2	63.0	59.0	48.2	35.8	28.3	43.8
Delaware Breakwater, Del	28.6	34.0	33.7	40.8	50.5	51.7	65.6	66.0	62.4	53.5	39.9	32.0	47.4
Baltimore, Md	24.0	30.2	30.0	38.0	48.2	60.2	62.8	62.4	57.6	49.1	34.0	27.3	43.7
Washington City	24.9	31.6	30.9	39.4	50.0	61.5	63.8	63.1	59.0	49.9	35.3	28.1	44.8
Cape Henry, Va	32.8	39.0	37.0	44.5	53.5	64.2	67.8	68.4	64.7	56.5	42.2	35.4	50.5
Chincoteague, Va	29.8	35.1	34.3	41.4	52.3	64.2	67.8	67.4	63.5	55.0	40.5	32.9	48.7
Lynchburg, Va	25.1	32.2	30.7	41.4	51.0	61.9	62.6	61.9	57.5	50.0	32.8	27.7	44.6
Norfolk, Va	82.5	39.0	37.0	44.6	54.3	64.4	68.6	68.0	64.0	56.3	41.7	35.0	50.5
South Atlantic States:													
Charlotte, N. C	32.7	39.6	37.6	45.3	52.9	62.2	64.4	63.7	60.2	53.2	37.4	32.9	48.5
Hatteras, N. C	40.1	45.0	43.4	49.5	58.8	68.4	71.6	71.3	68.1	61.3	48.3	42.7	55.7
Kitty Hawk, N. C	85.5	41.1	38.9	45.4	55.7	65.8	69.7	69.5	66.3	58.7	44.7	38.3	52.5
Macon, Fort, N. C	89.3	45.5	44.4	51.8	60.7	69.0	72.4	71.9	68.3	61.3	47.5	41.2	56.1
Smithville, N. C	40.6	46.8	45.5	53.3	61.1	68.7	72.5	71.6	67.8	60.1	45.5	41.7	56.3
Wilmington, N. C	39.5	45.3	43.7	50.7	58.9	66.9	71.4	70.5	66.6	59.2	44.2	39.0	54.7
Charleston, S. C	44.4	50.1	49.5	56.2	62.9	70.3	74.1	72.8	69.8	63.1	49.2	46.2	59.0
Augusta, Ga	88.8	44.7	43.9	51.2	57.6	66.8	68.9	68.2	65.7	57.5	42.7	39.6	53.8
Savannah, Ga	42.9	47.5	46.2	54.5	60.7	68.7	71.4	70.8	67.4	60.9	45.9	43.7	56.7
Jacksonville, Fla	49.5	53.0	52.2	59.4	63.5	70.5	73.2	72.2	69.6	65.5	53.5	50.7	61.1
Florida Peninsula:													
Cedar Keys, Fla	51.4	55.4	55.9	62.1	64.6	71.2	73.4	73.1	70.2	66.6	55.6	53.4	62.7
Key West, Fla	64.3	65.4	64.0	67.0	69.0	73.0	73.8	74.1	73.9	71.8	67.7	65.3	69.1
Eastern Gulf States:													
Atlanta, Ga	34.2	40.1	40.1	47.3	53.5	63.6	65.3	65.1	59.8	54.9	37.9	34.3	49.7
Pensacola, Fla	45.8	52.1	53.0	59.8	63.6	71.6	72.9	72.6	68.6	63.4	47.8	46.9	59.8
Mobile, Ala	44.4	49.8	51.4	58.0	62.2	70.5	71.8	70.6	67.0	62.6	49.1	45.8	58.6
Montgomery, Ala	39.9	45.7	45.5	53.0	57.3	67.4	69.3	68.8	63.0	57.3	43.7	40.9	54.3
Vicksburg, Miss	38.6	45.0	46.3	54.2	60.1	69.1	71.2	60.1	65.0	60.4	45.7	41.4	55.5
New Orleans, La	46.4	51.8	53.3	59.8	64.0	70.9	72.4	71.3	68.3	64.8	50.4	48.0	60.1
Western Gulf States:													
Shreveport, La	36.1	43.7	46.7	54.1	61.1	69.1	70.8	68.6	63.2	59.4	46.0	38.9	54.8
Little Rock, Ark	32.0	40.6	42.5	51.8	58.4	69.0	71.5	68.5	64.3	59.5	44.7	35.8	53.2
Galveston, Tex	47.2	53.4	58.0	62.4	66.9	73.1	75.0	73.8	70.7	67.7	55.4	51.6	62.9
Indianola, Tex	46.1	53.6	59.5	63.7	68.2	73.8	75.4	74.0	71.7	68.8	57.1	50.9	63.6
Palestine, Tex	31.4	39.8	47.4	54.4	61.6	69.1	71.5	67.5	63.5	59.3	46.0	38.5	54.1
Rio Grande Valley:													
Brownsville, Tex	50.4	57.2	62.5	65.7	70.2	74.1	74.8	72.8	70.7	69.5	59.9	54.7	65.2
Ohio Valley and Tennessee:													
Chattanooga, Tenn	32.3	39.2	38.8	47.2	53.9	64.8	66.3	66.3	62.7	56.1	39.3	33.0	50.0
Knoxville, Tenn	30.9	37.7	36.3	44.2	52.1	63.0	64.9	63.6	59.4	54.4	37.1	31.1	47.9
Memphis, Tenn	31.8	39.8	39.8	48.8	56.1	67.5	69.1	66.7	61.9	57.6	42.7	34.8	51.4
Nashville, Tenn	31.0	38.7	38.4	46.8	53.8	65.4	67.2	65.4	61.0	55.5	40.7	33.6	49.8
Louisville, Ky	25.4	33.5	33.3	41.6	53.0	64.3	64.8	62.6	59.1	52.9	38.1	29.8	46.5
Indianapolis, Ind	18.2	28.0	28.6	38.1	46.8	59.7	60.9	50.5	54.5	47.4	33.6	24.5	41.7
Cincinnati, Ohio	25.4	34.4	33.5	41.6	40.6	61.8	61.7	60.2	57.0	50.5	37.4	29.5	45.2
Columbus, Ohio	19.1	28.8	28.2	37.1	46.5	58.6	58.5	57.8	54.6	47.2	32.6	25.0	41.2
Pittsburg, Pa	22.9	89.4	29.0	36.6	47.1	58.8	59.6	59.3	54.8	47.2	34.0	28.1	42.3
Lower Lakes:													
Buffalo, N. Y	17.4	22.4	22.5	31.6	41.0	54.3	58.0	57.5	53.6	43.8	32.5	24.2	38.2
Oswego, N. Y	14.3	21.1	22.8	31.4	41.5	55.2	58.0	57.7	52.1	41.7	30.2	21.7	37.3
Erie, Pa	19.4	25.5	25.7	34.2	43.5	56.4	59.0	58.6	53.9	46.5	33.9	26.4	40.2

Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Lower Lakes—Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°
Cleveland, Ohio	17.9	25.1	25.5	32.4	42.0	55.6	57.6	57.4	52.6	43.7	31.6	24.2	38.9
Toledo, Ohio	17.2	24.5	25.2	33.6	44.2	58.0	59.1	59.3	54.2	45.1	32.0	23.3	39.6
Detroit, Mich	18.1	25.4	27.3	33.5	43.3	57.8	58.5	58.6	54.0	44.8	33.2	24.7	39.9
Upper Lakes:													
Alpena, Mich	9.8	13.2	15.9	26.1	35.2	50.5	53.4	54.9	49.1	39.0	28.4	18.4	32.8
Escanaba, Mich	6.6	9.8	14.8	26.3	35.5	50.6	54.3	55.4	49.8	39.1	25.7	15.0	31.9
Grand Haven, Mich	18.1	22.9	25.2	32.0	41.3	54.9	58.4	59.0	53.4	44.1	32.6	24.0	38.8
Marquette, Mich	5.2	8.4	13.0	25.5	32.5	45.3	50.6	53.0	47.3	36.7	24.3	14.4	29.7
Port Huron, Mich	14.7	20.9	22.9	31.8	40.7	54.3	57.1	57.8	52.6	42.7	31.6	22.0	37.4
Chicago, Ill	14.5	21.3	25.1	34.4	42.7	55.5	58.5	59.1	54.0	45.6	32.3	21.1	38.7
Milwaukee, Wis	11.9	19.8	24.3	32.6	40.1	53.4	56.9	58.6	53.2	43.8	30.0	19.0	36.9
Duluth, Minn	1.3	7.8	15.8	27.8	35.1	48.6	52.9	55.5	48.7	38.0	24.0	8.3	30.3
Upper Mississippi Valley:													
Saint Paul, Minn	4.2	10.2	18.7	32.4	41.6	56.6	58.7	58.8	50.7	39.7	24.2	9.5	33.8
La Crosse, Wis	5.7	14.0	21.0	32.1	39.7	55.0	58.0	58.8	53.1	41.6	27.5	13.2	35.0
Davenport, Iowa	9.2	19.1	24.8	37.2	46.2	59.8	61.2	60.1	54.2	45.5	31.2	18.8	39.0
Des Moines, Iowa	8.1	15.8	24.8	37.1	45.2	58.9	61.1	59.6	52.5	43.5	28.4	14.6	37.4
Dubuque, Iowa	4.1	14.1	22.0	33.1	42.3	56.8	58.4	58.1	52.2	42.5	27.3	13.7	35.4
Keokuk, Iowa	14.7	22.0	28.5	39.9	48.0	61.5	63.1	61.3	54.9	46.6	32.9	20.6	41.1
Cairo, Ill	27.0	35.8	37.3	46.4	54.0	66.9	68.6	65.8	61.3	54.7	39.9	30.8	49.0
Springfield, Ill	16.6	25.7	29.5	39.6	47.8	61.3	61.7	59.8	53.8	47.2	33.2	22.9	41.6
Saint Louis, Mo	21.0	30.6	35.0	45.3	54.1	65.2	66.5	65.2	58.9	52.7	39.3	28.2	46.8
Missouri Valley:													
Leavenworth, Kans	16.0	22.3	29.6	39.4	47.2	61.2	63.7	61.7	54.1	46.5	32.9	22.6	41.4
Omaha, Nebr	10.4	15.9	25.5	37.6	46.9	60.2	63.1	62.0	54.9	43.9	20.5	15.0	38.7
Bennett, Fort, Dak	5.0	9.1	21.5	33.0	42.7	56.5	57.7	56.1	44.7	34.9	21.3	10.0	32.7
Huron, Dak	—0.1	5.6	10.1	33.6	42.5	56.7	58.4	58.0	47.4	36.5	21.6	5.2	32.0
Yankton, Dak	5.2	12.4	21.5	34.6	43.5	58.2	60.2	60.1	50.0	39.3	24.9	9.8	35.0
Extreme Northwest:													
Moorhead, Minn	—5.4	—1.1	11.5	30.2	38.4	52.5	55.0	54.9	45.7	34.8	18.5	2.0	28.3
Saint Vincent, Minn	—9.0	—4.9	6.8	27.5	38.0	52.1	54.4	50.0	45.4	34.1	16.3	—1.1	26.8
Bismarck, Dak	—0.6	4.1	14.7	30.1	38.3	54.5	54.6	54.8	45.0	34.6	21.7	4.4	29.7
Buford, Fort, Dak	—0.6	1.5	15.1	29.7	38.5	51.8	52.1	51.7	40.3	32.4	19.9	3.3	27.9
Northern Slope:													
Assinaboine, Fort, Mont	2.1	2.6	16.1	27.4	36.2	45.5	45.1	45.7	36.5	27.9	18.3	5.1	25.7
Benton, Fort, Mont	5.6	7.9	21.9	27.7	38.1	48.3	45.9	47.6	39.6	29.2	17.7	6.1	28.0
Helena, Mont	9.5	10.7	21.7	29.4	35.8	45.9	47.3	44.6	38.5	30.0	22.8	12.4	29.0
Shaw, Fort, Mont	9.5	7.9	17.5	25.5	34.0	43.8	41.2	43.1	36.0	27.8	19.3	7.8	26.1
Deadwood, Dak	13.4	18.3	23.1	30.0	38.3	49.4	51.4	50.0	40.5	32.0	23.5	14.1	31.6
Cheyenne, Wyo	7.8	9.2	14.3	21.9	31.4	42.4	39.0	40.5	27.7	23.8	13.2	11.3	23.5
North Platte, Nebr	12.0	14.1	24.6	34.2	44.1	57.5	59.7	57.6	48.5	38.2	23.9	15.9	35.8
Middle Slope:													
Denver, Colo	14.5	14.1	21.4	26.9	36.7	46.6	47.3	46.6	36.8	30.6	20.3	16.3	29.8
Pike's Peak, Colo	—4.6	—1.2	3.5	7.0	16.4	25.3	20.1	29.5	23.6	15.4	6.1	2.0	12.6
Dodge City, Kans	16.1	18.8	26.5	34.1	45.6	59.7	61.0	60.2	51.2	42.4	27.1	18.8	38.5
Elliott, Fort, Tex	14.7	19.6	27.3	33.6	45.1	58.0	60.1	58.4	52.0	46.0	29.9	21.1	38.8
Southern Slope:													
Concho, Fort, Tex	31.3	39.2	44.0	44.3	55.0	64.3	62.0	62.2	60.1	56.1	43.2	33.6	49.7
Davis, Fort, Tex	24.5	29.2	32.0	29.9	39.2	50.6	55.2	54.1	51.5	44.7	35.3	28.0	39.5
Stockton, Fort, Tex	29.0	35.2	39.4	38.9	52.8	62.2	64.2	61.9	58.4	51.7	40.0	31.4	47.1
Southern Plateau:													
El Paso, Tex	23.9	29.4	18.2	24.5	31.4	43.7	54.9	56.3	50.5	41.5	34.5	27.4	37.2
Apache, Fort, Ariz	23.4	27.8	32.0	27.4	32.7	39.7	51.5	55.1	43.6	34.4	27.1	25.4	35.0
Grant, Fort, Ariz	24.1	29.4	29.2	24.0	29.0	38.4	50.8	54.8	43.9	36.3	30.3	28.4	34.9
Prescott, Ariz	19.0	24.4	28.0	24.8	29.3	36.2	51.4	52.0	38.6	31.0	24.6	24.2	31.9
Thomas, Camp, Ariz	29.7	35.4	37.7	31.3	37.0	43.1	54.7	58.7	49.1	38.2	35.1	32.4	40.2
Middle Plateau:													
Salt Lake City, Utah	12.0	13.3	24.3	29.7	33.0	39.2	40.7	45.2	37.2	31.8	22.3	21.3	29.1
Northern Plateau:													
Lewiston, Idaho	21.7	17.8	32.6	36.5	42.3	48.7	47.1	47.4	42.1	38.7	32.2	23.5	35.9
Dayton, Wash	24.2	17.9	32.8	35.3	41.5	47.8	46.3	45.6	41.1	37.7	33.4	24.1	35.6
Spokane Falls, Wash	18.9	16.8	30.8	36.0	41.5	48.1	46.5	46.7	41.5	36.9	31.1	20.9	34.6
North Pacific Coast:													
Olympia, Wash	33.0	29.3	37.4	41.4	44.7	48.4	49.0	51.4	48.8	44.2	40.2	33.9	41.8
Portland, Oreg	33.1	28.9	38.1	40.2	44.0	50.2	52.4	52.5	49.8	45.4	40.2	34.1	42.4
Middle Pacific Coast:													
Red Bluff, Cal	33.8	33.9	40.6	42.3	45.4	49.1	48.9	47.6	44.6	43.2	40.6	36.9	42.3
Sacramento, Cal	37.3	37.9	44.0	44.8	50.4	54.5	55.4	55.5	52.6	48.8	43.8	40.7	47.2
San Francisco, Cal	40.4	39.2	45.1	45.4	48.5	51.4	52.4	52.7	52.4	50.7	47.6	44.4	47.5
South Pacific Coast:													
Los Angeles, Cal	37.2	39.2	46.0	47.0	50.8	55.8	58.1	58.9	55.7	49.5	43.6	41.3	48.6
San Diego, Cal	39.5	41.8	47.9	48.4	52.2	56.6	59.7	61.7	58.2	51.3	46.8	43.9	50.6
Alaska Stations:													
Saint Michael's, Fort, Alaska	9.3	10.0	14.0	17.0	32.6	41.2	48.8	47.0	39.6	26.7	14.6	2.7	25.2
Sitka, Alaska	29.5	25.3	28.1	31.8	38.4	43.5	47.2	49.3	45.2	37.2	31.7	27.8	36.2

Dates of the first killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains, &c.—Continued.

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873–'74.	1874–'75.	1875–'76.	1876–'77.	1877–'78.	1878–'79.	1879–'80.	1880–'81.	1881–'82.	1882–'83.	1883–'84.	1884–'85.
Eastern Gulf States:	° ′	° ′												
Atlanta, Ga	33 45	84 23	....	....	....	....	....	Oct. 19	Nov. 4	Nov. 15	Nov. 4	Nov. 22	Nov. 13	Nov. 6
Pensacola, Fla	30 25	87 13	....	....	....	....	....	....	Dec. 26	Nov. 16	Nov. 25	Nov. 29	Dec. 16	Dec. 19
Mobile, Ala	30 41	88 2	Nov. 20	Nov. 2	Dec. 18	Nov. 9	Nov. 12	Nov. 2	Nov. 22	Dec. 8	Nov. 25	Nov. 15	Dec. 16	Nov. 25
Montgomery, Ala	32 23	86 18	Oct. 29	Dec. 15	Dec. 9	Nov. 10	Nov. 4	Nov. 1	Nov. 22	Nov. 7	Nov. 26	Nov. 15	Nov. 8	Nov. 7
Vicksburg, Miss	32 22	90 53	Oct. 20	Nov. 1	Dec. 18	Nov. 20	Nov. 7	Nov. 1	Nov. 19	Nov. 7	Nov. 4	Nov. 14	Nov. 16	Nov. 6
New Orleans, La	29 58	90 4	Nov. 20	Dec. 21	Dec. 9	Nov. 21	Nov. 11	Dec. 16	Dec. 26	Nov. 19	Nov. 25	Dec. 8	Jan. 2	Dec. 19
Western Gulf States:														
Shreveport, La	32 30	93 40	Oct. 29	Nov. 1	Nov. 11	Dec. 3	Nov. 7	Oct. 23	Nov. 21	Dec. 7	Nov. 20	Nov. 14	Nov. 15	Nov. 7
Fort Smith, Ark	35 22	94 24	....	....	....	....	....	....	....	....	....	Nov. 13	Nov. 1	Oct. 28
Little Rock, Ark	34 45	92 6	....	....	....	....	....	....	Nov. 4	Nov. 1	Nov. 13	Nov. 18	Nov. 2	Nov. 7
Galveston, Tex	29 18	94 47	....	Jan. 9	(1)	Dec. 25	Dec. 7	Dec. 25	Dec. 26	Nov. 18	(1)	Jan. 9	Jan. 2	Dec. 18
Indianola, Tex	28 32	96 31	....	Jan. 5	(1)	Nov. 15	Nov. 30	Dec. 23	Dec. 24	Nov. 18	Nov. 25	Nov. 30	Jan. 9	(1)
Palestine, Tex	31 45	95 40	....	....	....	....	....	....	....	....	Dec. 15	Nov. 13	Nov. 13	Nov. 20
Rio Grande Valley:														
Brownsville, Tex	25 53	97 26	....	....	....	Dec. 26	(1)	Dec. 25	Dec. 25	Dec. 20	(1)	Jan. 9	Jan. 8	Dec. 23
Rio Grande City, Tex	26 23	98 48	....	....	....	....	Dec. 7	Nov. 27	Nov. 19	Dec. 21	(1)	(2)	Jan. 2	Jan. 2
Ohio Valley and Tennessee:														
Chattanooga, Tenn	35 4	85 15	....	....	....	....	....	....	Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24
Knoxville, Tenn	35 56	83 58	Oct. 29	Oct. 13	Oct. 17	Oct. 16	Nov. 3	Oct. 20	Oct. 26	Oct. 18	Nov. 4	Nov. 14	Nov. 2	Oct. 24
Memphis, Tenn	35 9	90 3	Oct. 28	Oct. 13	Oct. 12	Oct. 2	Nov. 3	Oct. 28	Nov. 4	Nov. 2	Oct. 20	Nov. 13	Nov. 2	Oct. 24
Nashville, Tenn	36 10	86 47	Oct. 29	Oct. 14	Oct. 12	Oct. 8	Nov. 3	Oct. 20	Oct. 24	Oct. 18	Oct. 20	Nov. 13	Nov. 2	Oct. 24
Louisville, Ky	38 15	85 45	Oct. 7	Oct. 13	Oct. 12	Oct. 9	Nov. 3	Oct. 19	Oct. 25	Oct. 23	Nov. 4	Nov. 14	Nov. 2	Oct. 24
Greencastle, Ind	39 40	86 53	....	....	....	....	....	....	....	....	....	....	....	Oct. 23
Indianapolis, Ind	39 46	86 10	Oct. 24	Oct. 13	Oct. 12	Oct. 16	Nov. 1	Oct. 12	Oct. 24	Oct. 18	Nov. 15	Nov. 13	Dec. 11	Nov. 6
Cincinnati, Ohio	39 6	84 30	Oct. 7	Oct. 19	Oct. 12	Oct. 11	Nov. 6	Oct. 19	Oct. 20	Oct. 17	Nov. 4	Oct. 25	Nov. 2	Oct. 24
Columbus, Ohio	39 58	83 0	....	....	....	....	....	Oct. 22	Oct. 20	Oct. 19	Nov. 4	Oct. 21	Nov. 3	Nov. 7
Pittsburg, Pa	40 32	80 2	Oct. 28	Oct. 15	Oct. 13	Oct. 9	Nov. 4	Oct. 7	Sept. 25	Oct. 19	Nov. 4	Oct. 21	Nov. 15	Oct. 24
Lower Lakes:														
Buffalo, N. Y	42 53	78 53	Oct. 26	Nov. 12	Oct. 12	Oct. 12	Nov. 5	Sept. 28	Sept. 26	Oct. 28	Oct. 5	Oct. 4	Oct. 1	Oct. 15
Oswego, N. Y	43 29	76 35	Oct. 29	Oct. 16	Oct. 14	Oct. 19	Nov. 5	Nov. 1	Oct. 24	Oct. 20	Oct. 27	Oct. 21	Oct. 1	Oct. 10
Rochester, N. Y	43 8	77 42	Oct. 31	Nov. 1	Oct. 2	Oct. 9	Nov. 4	Oct. 31	Oct. 24	Oct. 24	Oct. 26	Oct. 21	(2)	Oct. 10
Erie, Pa	42 7	80 5	Oct. 28	Oct. 31	Nov. 3	Oct. 12	Nov. 5	Dec. 4	Nov. 2	Oct. 28	Oct. 11	Nov. 4	Oct. 5	Oct. 24
Cleveland, Ohio	41 30	81 42	Oct. 28	Oct. 31	Sept. 24	Oct. 9	Nov. 7	Nov. 5	Nov. 19	Nov. 14	Nov. 16	Oct. 21	Oct. 17	Oct. 24
Sandusky, Ohio	41 25	82 40	....	....	....	....	Nov. 5	Oct. 20	Oct. 25	Oct. 20	Nov. 15	Nov. 5	Oct. 27	Oct. 29
Toledo, Ohio	41 40	83 34	Oct. 7	Oct. 14	Sept. 21	Oct. 9	Oct. 5	Oct. 6	Sept. 25	Sept. 30	Oct. 5	Oct. 20	Sept. 9	Oct. 15
Detroit, Mich	42 20	83 3	Oct. 6	Oct. 13	Oct. 13	Oct. 9	Oct. 5	Oct. 6	Sept. 25	Sept. 30	Oct. 19	Oct. 20	Oct. 1	Oct. 15
Upper Lakes:														
Alpena, Mich	45 5	83 30	Oct. 6	Oct. 14	Sept. 11	Oct. 5	Sept. 21	Sept. 22	Oct. 19	Sept. 22	Oct. 6	Sept. 24	Sept. 10	Sept. 14
Escanaba, Mich	45 48	87 5	Oct. 19	Oct. 4	Oct. 1	Oct. 4	Oct. 5	Sept. 22	Sept. 17	Oct. 4	Oct. 5	Nov. 13	Sept. 28	Oct. 9
Grand Haven, Mich	43 5	86 18	Oct. 2	Oct. 19	Oct. 9	Oct. 11	Oct. 12	Sept. 27	Sept 21	Sept. 30	Oct. 10	Oct. 24	Sept. 10	Oct. 9
Mackinaw City, Mich	45 47	84 39	....	....	....	....	....	....	....	....	....	Sept. 27	Sept. 20	Nov. 9
Marquette, Mich	46 34	87 24	Oct. 16	Oct. 12	Sept. 22	Oct. 4	Sept. 5	Oct. 19	Oct. 23	Oct. 7	Oct. 14	Sept. 25	Sept. 28	Sept. 22

Port Huron, Mich	43 0	82 26	....	Oct. 14	Oct. 12	Oct. 10	Oct. 5	Nov. 14	Sept. 25	Oct. 26	Oct. 11	Oct. 16	Sept. 26	Oct. 24
Chicago, Ill	41 52	87 38	Oct. 23	Oct. 31	Oct. 2	Oct. 4	Oct. 23	Oct. 19	Oct. 20	Oct. 16	Oct. 19	Nov. 18	Oct. 1	Oct. 28
Milwaukee, Wis	43 2	87 54	Oct. 7	Oct. 18	Sept. 17	Sept. 30	Sept. 18	Nov. 3	Oct. 24	Oct. 13	Nov. 4	Oct. 19	Oct. 1	Oct. 9
Duluth, Minn	46 48	92 6	Oct. 6	Oct. 12	Oct. 8	Sept. 29	Oct. 30	Sept. 21	Sept. 21	Oct. 16	Oct. 10	Sept. 20	Oct. 21	Oct. 8
Upper Mississippi Valley:														
Saint Paul, Minn	44 58	93 3	Sept. 1	Oct. 12	Oct. 11	Sept. 29	Oct. 19	Oct. 18	Oct. 23	Oct. 12	Oct. 5	Oct. 18	Sept. 30	Oct. 22
La Crosse, Wis	43 49	91 15	Oct. 20	Oct. 18	Oct. 16	Oct. 5	Oct. 6	Oct. 19	Sept. 24	Oct. 12	Oct. 5	Oct. 19	Oct. 1	Oct. 22
Davenport, Iowa	41 30	90 38	Oct. 22	Oct. 12	Sept. 18	Oct. 5	Oct. 11	Oct. 27	Oct. 30	Oct. 4	Nov. 10	Nov. 2	Oct. 8	Oct. 23
Des Moines, Iowa	41 35	93 37	....	....	....	....	....	Sept. 12	Oct. 20	Nov. 8	Nov. 9	Nov. 13	Oct. 20	Oct. 23
Dubuque, Iowa	42 30	90 44	Oct. 20	Oct. 13	Oct. 18	Oct 7	Oct. 30	Sept. 12	Oct. 19	Sept. 27	Oct. 19	Oct. 19	Sept. 26	Oct. 28
Keokuk, Iowa	40 22	91 26	Oct. 6	Oct. 31	Sept. 18	Oct. 7	Nov. 5	Oct. 19	Oct. 24	Oct. 4	Nov. 3	Nov. 13	Oct. 15	Oct. 23
Cairo, Ill	37 0	89 10	Oct. 21	Oct. 13	Oct. 2	Oct. 15	Nov. 3	Oct. 19	Nov. 8	Nov. 1	Nov. 15	Nov. 13	Nov. 2	Oct. 24
Springfield, Ill	39 48	89 39	....	....	....	....	....	....	Sept. 25	Oct. 4	Oct. 19	Oct. 18	Oct. 16	Oct. 23
Saint Louis, Mo	38 38	90 12	Oct. 23	Oct. 31	Oct. 31	Oct. 16	Nov. 3	Oct. 18	Nov. 20	Nov. 1	Oct. 20	Nov. 13	Nov. 12	Oct. 23
Missouri Valley:														
Leavenworth, Kans	39 19	94 57	Oct. 6	Oct. 13	Oct. 30	Oct. 11	Oct. 4	Sept. 18	Oct. 19	Oct. 17	Nov. 9	Nov. 12	Oct. 26	Oct. 22
Omaha, Nebr	41 16	95 56	Sept. 29	Oct. 12	Oct. 11	Oct. 11	Oct. 4	Sept. 26	Sept. 20	Oct. 18	Nov. 10	Nov. 18	Oct. 20	Nov. 4
Bennett, Fort, Dak	44 43	100 39	....	....	....	....	....	....	....	Nov. 10	Oct. 18	Oct. 16	Oct. 14	Sept. 30
Huron, Dak	44 21	98 0	....	....	....	....	....	....	....	....	Oct. 9	Sept. 21	Sept. 8	Oct. 8
Yankton, Dak	42 54	97 28	Sept. 13	Sept. 15	Sept. 20	Sept. 29	Oct. 4	Sept. 26	Oct. 23	Oct. 3	Oct. 16	Sept. 23	Oct. 2	Oct. 21
Extreme Northwest:														
Moorhead, Minn	46 52	96 44	....	....	....	....	....	....	....	....	Sept. 15	Sept. 20	Sept. 8	Oct. 8
Saint Vincent, Minn	48 56	97 14	....	....	....	....	....	....	....	Sept. 13	Sept. 6	Sept. 20	Sept. 8	Sept. 20
Bismarck, Dak	46 47	100 38	....	....	Sept. 19	Sept. 20	Sept. 20	Sept. 10	Sept. 18	Sept. 13	Sept. 15	Sept. 23	Sept. 8	Sept. 27
Buford, Fort, Dak	48 0	103 56	....	....	....	....	....	....	Sept. 7	Sept. 21	Sept. 17	Nov. 9	Aug. 22	Sept. 30
Totten, Fort, Dak	47 57	98 57	....	....	....	....	....	....	....	....	....	....	....	Sept. 30
Northern Slope:														
Assinaboine, Fort, Mont	48 32	109 42	....	....	....	....	....	....	....	Sept. 12	Sept. 6	Oct. 3	Sept. 20	Sept. 29
Benton, Fort, Mont	47 50	110 40	Sept. 24	Sept. 20	Oct. 11	(2)	(2)	(2)	(2)	Sept. 20	Sept. 6	Oct. 21	Sept. 20	Sept. 7
Custer, Fort, Mont	45 42	107 34	....	....	....	....	....	....	Oct. 12	Sept. 12	Oct. 8	Nov. 19	Oct. 11	Sept. 30
Helena, Mont	46 34	112 4	....	....	....	....	....	....	....	Oct. 22	Sept. 6	Sept. 29	Sept. 20	Oct. 4
Maginnis, Fort, Mont	47 12	109 10	....	....	....	....	....	....	....	....	....	....	....	Sept. 26
Poplar River, Mont	48 8	105 10	....	....	....	....	....	....	....	....	....	Sept. 23	Sept. 22	Sept. 30
Shaw, Fort, Mont	47 31	111 48	....	....	....	....	....	....	....	Sept. 12	Sept. 6	Sept. 19	Aug. 22	Sept. 7
Deadwood, Dak	44 23	103 43	....	....	....	....	....	....	Sept. 7	Sept. 13	Sept. 30	Oct. 10	Sept. 21	Sept. 30
Cheyenne, Wyo	41 8	104 48	Sept. 18	Sept. 8	Sept. 20	Sept. 14	Sept. 17	Sept. 11	Oct. 26	Sept. 12	Sept. 15	July 9	Sept. 4	Sept. 11
North Platte, Nebr	41 8	100 45	....	Oct. 12	Sept. 10	Sept. 29	Oct. 4	Sept. 10	Sept. 12	Sept. 13	Sept. 16	Oct. 16	Oct. 9	Oct. 8
Middle Slope:														
Denver, Colo	39 45	105 0	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Pike's Peak, Colo	38 50	105 2	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	Aug. 5	(3)
West Las Animas, Colo	38 4	103 12	....	....	....	....	....	....	....	....	....	Oct. 10	Oct. 25	Nov. 12
Dodge City, Kans	37 45	100 0	....	Oct. 29	Oct. 26	Sept. 30	Oct. 4	Oct. 27	Oct. 23	Oct. 16	Oct. 18	Nov. 2	Oct. 14	Oct. 30
Elliott, Fort, Tex	35 30	100 21	....	....	....	....	....	....	....	Dec. 20	Nov. 12	Oct. 19	Oct. 25	Nov. 6
Southern Slope:														
Sill, Fort, Ind. T	34 40	98 23	....	....	....	Oct. 1	Oct. 9	Oct. 27	Nov. 18	Dec. 1	Nov. 8	Nov. 29	(1)	Nov. 19
Concho, Fort, Tex	31 25	100 34	....	....	....	....	Nov. 6	Oct. 22	Nov. 18	Nov. 6	Nov. 25	Nov. 30	Dec. 8	Nov. 19
Davis, Fort, Tex	30 38	103 56	....	....	....	....	....	Nov. 25	Oct. 18	Oct. 4	Nov. 8	Oct. 19	Dec. 9	Oct. 28
Stockton, Fort, Tex	30 53	102 58	....	....	....	....	Oct. 21	Nov. 12	Nov. 18	Nov. 6	Dec. 14	Nov. 27	Dec. 9	Nov. 30
Southern Plateau:														
El Paso, Tex	31 47	106 30	....	....	....	....	....	Feb. 7	Nov. 19	Dec. 19	Nov. 11	Nov. 13	Nov. 13	Nov. 19

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[1] None observed.

[2] No record.

[3] Every month in the year.

APPENDIX 42.

Dates of the last light frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884–'85.

Stations.	Latitude.	Longitude.	Date.
	° ′	° ′	1884–'85.
New England:			
Eastport, Me	44 54	66 59	Apr. 16
Portland, Me	43 39	70 15	(1)
Mount Washington, N. H	44 16	71 18	(2)
Boston, Mass	42 21	71 4	Feb. 28
Block Island, R. I	41 10	71 36	Mar. 9
New Haven, Conn	41 18	72 56	May 12
New London, Conn	41 21	72 5	June 10
Middle Atlantic States:			
Albany, N. Y	42 39	73 45	May 4
New York City	40 43	74 0	(1)
Philadelphia, Pa	39 57	75 9	Apr. 20
Atlantic City, N. J	39 22	74 25	Apr. 9
Barnegat City, N. J	39 46	74 6	(3)
Cape May, N. J	38 56	74 58	Apr. 14
Sandy Hook, N. J	40 28	74 0	May 12
Baltimore, Md	39 18	76 37	Apr. 9
Washington City	38 54	77 2	Apr. 20
Cape Henry, Va	36 56	76 0	Mar. 30
Chincoteague, Va	37 55	75 23	May 12
Lynchburg, Va	37 25	79 9	May 11
Norfolk, Va	36 51	76 17	Apr. 14
South Atlantic States:			
Charlotte, N. C	35 13	80 51	Apr. 9
Hatteras, N. C	35 15	75 40	Mar. 24
Kitty Hawk, N. C	36 0	75 42	Jan. 30
Macon, Fort, N. C	34 42	76 40	Apr. 14
Smithville, N. C	33 55	78 1	Mar. 23
Wilmington, N. C	34 14	77 57	Mar. 22
Charleston, S. C	32 47	79 56	Mar. 24
Augusta, Ga	33 28	81 54	Mar. 17
Savannah, Ga	32 5	81 5	Mar. 19
Jacksonville, Fla	30 20	81 39	Mar. 19
Florida Peninsula:			
Cedar Keys, Fla	29 8	83 2	Feb. 21
Key West, Fla	24 34	81 49	(3)
Sanford, Fla	28 48	81 23	Mar. 10
Eastern Gulf States:			
Atlanta, Ga	33 45	84 23	Apr. 14
Pensacola, Fla	30 25	87 13	Apr. 5
Mobile, Ala	30 41	88 2	Mar. 10
Montgomery, Ala	32 23	86 18	Mar. 16
Vicksburg, Miss	32 22	90 53	Mar. 29
New Orleans, La	29 58	90 4	Mar. 10
Western Gulf States:			
Shreveport, La	32 30	93 40	Mar. 29
Fort Smith, Ark	35 22	94 24	Apr. 13
Little Rock, Ark	34 45	92 6	Mar. 16
Galveston, Tex	29 18	94 47	Feb. 12
Indianola, Tex	28 32	96 31	Feb. 16
Palestine, Tex	31 45	95 40	Mar. 29
Rio Grande Valley:			
Brownsville, Tex	25 53	97 26	Jan. 18
Rio Grande City, Tex	26 23	98 48	Jan. 26
Ohio Valley and Tennessee:			
Chattanooga, Tenn	35 4	85 15	May 11
Knoxville, Tenn	35 56	83 58	May 11
Memphis, Tenn	35 9	90 3	May 10
Nashville, Tenn	36 10	86 47	May 10
Louisville, Ky	38 15	85 45	Apr. 13
Greencastle, Ind	39 40	86 53	May 8
Indianapolis, Ind	39 46	86 10	May 10
Cincinnati, Ohio	39 6	84 30	Apr. 29
Columbus, Ohio	39 58	83 0	May 8
Pittsburg, Pa	40 32	80 2	May 8
Lower Lakes:			
Buffalo, N. Y	42 53	78 53	May 3
Lower Lakes—Cont'd:			
Oswego, N. Y	43 29	76 35	June 3
Rochester, N. Y	43 8	77 42	May 28
Erie, Pa	42 7	80 5	(1)
Cleveland, Ohio	41 30	81 42	May 2
Sandusky, Ohio	41 25	82 40	Apr. 29
Toledo, Ohio	41 40	83 34	May 10
Detroit, Mich	42 20	83 3	Apr. 29
Upper Lakes:			
Alpena, Mich	45 5	83 30	May 13
Escanaba, Mich	45 48	87 5	June 29
Grand Haven, Mich	43 5	86 18	June 29
Mackinaw City, Mich	45 47	84 39	May 12
Marquette, Mich	46 34	87 24	June 8
Port Huron, Mich	43 0	82 26	June 23
Chicago, Ill	41 52	87 38	May 11
Milwaukee, Wis	43 2	87 54	Apr. 29
Duluth, Minn	46 48	92 6	May 11
Upper Mississippi Valley:			
Saint Paul, Minn	44 58	93 3	May 10
La Crosse, Wis	43 49	91 15	June 23
Davenport, Iowa	41 30	90 38	May 10
Des Moines, Iowa	41 35	93 37	June 9
Dubuque, Iowa	42 30	90 44	June 9
Keokuk, Iowa	40 22	91 26	May 10
Cairo, Ill	37 0	89 10	May 10
Springfield, Ill	39 48	89 39	May 10
Saint Louis, Mo	38 38	90 12	May 8
Missouri Valley:			
Lamar, Mo	37 32	94 15	May 10
Leavenworth, Kans	39 19	94 57	May 10
Omaha, Nebr	41 16	95 56	May 10
Bennett, Fort, Dak	44 43	100 39	Apr. 26
Huron, Dak	44 21	98 9	Apr. 28
Yankton, Dak	42 54	97 28	June 23
Extreme Northwest:			
Moorhead, Minn	46 52	96 44	June 22
Saint Vincent, Minn	48 56	97 14	June 22
Bismarck, Dak	46 47	100 38	June 23
Buford, Fort, Dak	48 0	103 56	June 8
Totten, Fort, Dak	47 57	98 57	May 16
Northern Slope:			
Assinaboine, Fort, Mont	48 32	109 42	May 10
Benton, Fort, Mont	47 50	110 40	Apr. 28
Custer, Fort, Mont	45 42	107 34	(3)
Helena, Mont	46 34	112 4	June 8
Maginnis, Fort, Mont	47 12	109 10	June 15
Poplar River, Mont	48 8	105 10	May 24
Shaw, Fort, Mont	47 31	111 48	June 8
Deadwood, Dak	44 23	103 43	June 15
Cheyenne, Wyo	41 8	104 48	June 15
North Platte, Nebr	41 8	100 45	June 15
Middle Slope:			
Denver, Colo	39 45	105 0	Apr. 30
Pike's Peak, Colo	38 50	105 2	(2)
West Las Animas, Colo	38 4	103 12	Apr. 15
Dodge City, Kans	37 45	100 0	May 12
Elliott, Fort, Tex	35 30	100 21	Mar. 22
Southern Slope:			
Sill, Fort, Ind. T	34 40	98 28	Mar. 9
Concho, Fort, Tex	31 25	100 34	Mar. 2
Davis, Fort, Tex	30 38	103 56	Apr. 23
Stockton, Fort, Tex	30 53	102 53	Feb. 12
Southern Plateau:			
El Paso, Tex	31 47	106 30	Apr. 25

[1] No reliable record.

[2] Frost every month in the year.

[3] No frost observed.

APPENDIX 43.

Dates of the last killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for each winter from 1873-'74 *to* 1884-'85.

Stations.	Latitude.	Longitude.	Winter of—											
			1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.	1884-'85.
New England:	° ′	° ′												
Eastport, Me	44 54	66 59	May 2	June 19	Apr. 30	Apr. 3	Apr. 10	Apr. 21	May 1	May 4	Apr. 14	Apr. 30	Apr. 23	May 4
Portland, Me	43 39	70 15	Apr. 30	Apr. 22	Apr. 9	Apr. 4	Mar. 26	Apr. 20	Apr. 13	Apr. 15	Apr. 12	Mar. 24	Apr. 22	Apr. 11
Mount Washington, N. H	44 16	71 18	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Boston, Mass	42 21	71 4	May 3	Apr. 22	Apr. 9	Apr. 19	Mar. 26	Apr. 19	Apr. 13	Apr. 22	May 8	Apr. 20	Apr. 22	Apr. 15
Block Island, R. I	41 10	71 36	....	....	....	....	....	....	....	Apr. 7	Mar. 28	Apr. 8	Apr. 6	Mar. 19
New Haven, Conn	41 18	72 56	Apr. 30	Apr. 22	May 1	Apr. 13	Mar. 26	May 24	Mar. 8	Apr. 23	May 16	Apr. 30	May 30	May 4
New London, Conn	41 21	72 5	Apr. 18	Apr. 8	May 1	May 5	Mar. 10	May 24	Apr. 12	Apr. 7	May 8	Apr. 29	Apr. 6	Apr. 18
Middle Atlantic States:														
Albany, N. Y	42 39	73 45	May 7	May 1	May 1	May 3	May 14	Apr. 20	Apr. 13	Apr. 7	Apr. 12	Apr. 8	Apr. 1	Apr. 10
New York City	40 43	74 0	May 20	Apr. 25	Apr. 10	Apr. 8	Mar. 26	Apr. 6	Apr. 12	Apr. 4	Apr. 12	Apr. 2	Mar. 31	Apr. 15
Philadelphia, Pa	39 57	75 9	Apr. 29	Apr. 22	Apr. 10	Apr. 3	Mar. 26	Apr. 6	Mar. 13	Apr. 7	Apr. 12	Apr. 1	Mar. 31	Apr. 14
Atlantic City, N. J	39 22	74 25	Apr. 29	Apr. 25	Apr. 20	Apr. 11	Mar. 25	Apr. 20	Apr. 12	Apr. 7	Feb. 27	Mar. 31	Apr. 7	Mar. 23
Barnegat City, N. J	39 46	74 6	Apr. 13	Apr. 25	Apr. 9	Apr. 8	May 14	Apr. 13	Apr. 12	Mar. 8	Jan. 15	Apr. 30	Mar. 31	Apr. 14
Cape May, N. J	38 56	74 58	Apr. 18	Apr. 21	Apr. 9	Apr. 3	Mar. 26	Apr. 6	Apr. 12	Mar. 16	May 3	Mar. 9	Apr. 8	Apr. 14
Sandy Hook, N. J	40 28	74 0	Apr. 30	Apr. 22	Apr. 9	Mar. 29	Mar. 25	Apr. 6	Apr. 11	Apr. 7	Feb. 27	Apr. 2	Mar. 31	Mar. 30
Delaware Breakwater, Del	38 48	75 10	....	....	....	....	....	....	Apr. 12	Apr. 6	Apr. 12	Apr. 1	Mar. 31	(3)
Baltimore, Md	39 18	76 37	Apr. 13	Apr. 22	Apr. 2	Apr. 3	Mar. 26	Apr. 5	Apr. 12	Apr. 21	May 8	Apr. 25	Mar. 30	Mar. 16
Washington City	38 54	77 2	Apr. 29	Apr. 18	Apr. 26	Mar. 31	Mar. 26	Mar. 25	Apr. 12	Apr. 7	Apr. 12	Mar. 1	Mar. 31	Mar. 14
Cape Henry, Va	36 56	76 0	Mar. 25	Apr. 19	Mar. 22	Mar. 20	Mar. 25	Mar. 6	Mar. 25	Mar. 29	Feb. 5	Mar. 25	Mar. 5	Feb. 24
Chincoteague, Va	37 55	75 28	....	....	....	....	....	....	Mar. 18	Apr. 7	Apr. 12	Apr. 1	Mar. 31	Apr. 11
Lynchburg, Va	37 25	79 9	Apr. 18	Apr. 19	Apr. 19	Apr. 15	Mar. 26	Apr. 4	Apr. 12	Apr. 7	May 8	Apr. 2	Mar. 10	Mar. 30
Norfolk, Va	36 51	76 17	Apr. 13	Apr. 19	Mar. 23	Mar. 20	Mar. 21	Mar. 6	Apr. 12	Apr. 7	Feb. 26	Mar. 23	Mar. 5	Apr. 11
South Atlantic States:														
Charlotte, N. C	35 13	80 51	....	....	....	....	....	May 3	Apr. 13	Apr. 15	Mar. 25	Mar. 23	Mar. 10	Apr. 14
Hatteras, N. C	35 15	75 40	....	....	....	....	....	....	....	Apr. 5	Jan. 4	Mar. 23	Mar. 5	Feb. 21
Kitty Hawk, N. C	36 0	75 42	....	Apr. 19	Mar. 5	Mar. 18	Jan. 18	Mar. 6	Mar. 25	Apr. 7	Feb. 26	Mar. 23	Mar. 5	Feb. 28
Macon, Fort, N. C	34 42	76 40	....	....	....	....	....	....	....	Apr. 6	Feb. 25	Mar. 23	Mar. 4	Mar. 23
Smithville, N. C	33 55	78 1	....	....	Mar. 22	Mar. 11	Feb. 12	Mar. 19	Feb. 20	Apr. 6	Feb. 1	Mar. 23	Mar. 4	Mar. 24
Wilmington, N. C	34 14	77 57	Mar. 14	Apr. 19	Mar. 4	Mar. 18	Feb. 19	Apr. 4	Feb. 16	Mar. 8	Jan. 23	Mar. 23	Mar. 4	Mar. 24
Charleston, S. C	32 47	79 56	Jan. 17	Feb. 8	Mar. 22	Mar. 11	Feb. 12	Feb. 3	Mar. 30	Apr. 2	Jan. 4	Jan. 12	Feb. 29	Feb. 11
Augusta, Ga	33 28	81 54	Feb. 11	Feb. 21	Mar. 19	Mar. 11	Feb. 12	Mar. 2	Apr. 12	Apr. 2	Feb. 6	Mar. 23	Mar. 1	Apr. 14
Savannah, Ga	32 5	81 5	Feb. 5	Feb. 9	Mar. 22	Mar. 10	Feb. 12	Feb. 10	(2)	Jan. 26	Jan. 4	Jan. 13	Feb. 29	Apr. 13
Jacksonville, Fla	30 20	81 39	....	Feb. 2	Mar. 22	Jan. 5	Feb. 12	Jan. 10	Dec. 18	Feb. 4	Feb. 6	Mar. 23	Jan. 22	Mar. 17
Florida Peninsula:														
Cedar Keys, Fla	29 8	83 2	....	....	....	....	....	....	....	Dec. 22	Jan. 3	Jan. 12	Jan. 22	Feb. 11

[1] Frost every month in the year.

[2] No killing frost reported.

[3] Station closed April 1, 1885.

Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873–'74.	1874–'75.	1875–'76.	1876–'77.	1877–'78.	1878–'79.	1879–'80.	1880–'81.	1881–'82.	1882–'83.	1883–'84.	1884–'85.
Florida Peninsula—Continued:	° ′	° ′												
Key West, Fla	24 34	81 49	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sanford, Fla	28 48	81 23											Jan. 22	(1)
Eastern Gulf States:														
Atlanta, Ga	33 45	84 23						Mar. 18	Feb. 15	Apr. 5	Feb. 2	Apr. 3	Mar. 10	Mar. 24
Pensacola, Fla	30 25	87 13							Dec. 27	Mar. 23	Feb. 5	Jan. 20	Feb. 29	Mar. 23
Mobile, Ala	30 41	88 2	Jan. 16	Feb. 8	Mar. 22	Jan. 25	Feb. 6	Jan. 10	Dec. 27	Apr. 2	Feb. 5	Mar. 23	Feb. 29	Mar. 23
Montgomery, Ala	32 23	86 18	Feb. 11	Feb. 9	Mar. 22	Mar. 7	Feb. 16	Mar. 18	Feb. 7	Apr. 5	Feb. 2	Mar. 13	Mar. 1	Mar. 11
Vicksburg, Miss	32 22	90 53	Jan. 16	Feb. 8	Mar. 22	Mar. 10	Feb. 12	Feb. 19	Feb. 14	Apr. 2	Feb. 1	Feb. 19	Feb. 29	Mar. 9
New Orleans, La	29 58	90 4		Jan. 10	(1)	Jan. 4	Feb. 12	Jan. 10	Dec. 26	Jan. 12	Nov. 26	Jan. 23	Jan. 26	Jan. 18
Western Gulf States:														
Shreveport, La	32 30	93 40	Feb. 24	Mar. 7	Mar. 21	Mar. 10	Feb. 4	Jan. 20	Feb. 4	Feb. 2	Feb. 23	Feb. 19	Feb. 29	Mar. 23
Fort Smith, Ark	35 22	94 24										Mar. 22	Mar. 9	Mar. 20
Little Rock, Ark	34 45	92 6							Mar. 17	Apr. 14	Feb. 22	Mar. 27	Mar. 9	Mar. 29
Galveston, Tex	29 18	94 47		Jan. 11	(1)	Jan. 1	Feb. 11	Jan. 9	Dec. 26	Feb. 22	(1)	Feb. 18	Feb. 15	Feb. 11
Indianola, Tex	28 32	96 31		Apr. 1	(1)	Jan. 10	Nov. 30	Jan. 9	Mar. 15	Apr. 14	Dec. 16	Feb. 18	Feb. 15	Feb. 14
Palestine, Tex	31 45	95 40										Mar. 20	Mar. 9	Mar. 23
Rio Grande Valley:														
Brownsville, Tex	25 53	97 26				Jan. 9	(1)	Jan. 9	Dec. 26	Jan. 11	(1)	Feb. 18	Jan. 25	Feb. 14
Rio Grande City, Tex	26 23	98 48						Jan. 6	Feb. 15	Jan. 10	Dec. 16	(2)	Mar. 1	Feb. 14
Ohio Valley and Tennessee:														
Chattanooga, Tenn	35 4	85 15						Apr. 6	Jan. 25	Apr. 5	Feb. 25	Mar. 22	Mar. 10	Mar. 24
Knoxville, Tenn	35 56	83 58	Mar. 25	Apr. 19	Apr. 19	Mar. 29	Mar. 26	Apr. 12	Apr. 13	Apr. 10	Mar. 25	Apr. 25	Apr. 11	Apr. 14
Memphis, Tenn	35 9	90 3	Feb. 26	Apr. 2	Mar. 18	Mar. 25	Mar. 5	Apr. 5	Mar. 17	Apr. 1	Apr. 16	Mar. 22	Mar. 10	Apr. 4
Nashville, Tenn	36 10	86 47	Mar. 25	Apr. 17	Mar. 29	Mar. 26	Mar. 5	Apr. 12	Apr. 12	Apr. 5	Feb. 2	Apr. 3	Mar. 10	Apr. 5
Louisville, Ky	38 15	85 45	Apr. 10	Apr. 18	Mar. 31	Mar. 22	Apr. 19	Apr. 8	Mar. 17	Apr. 14	Apr. 11	Apr. 3	Mar. 10	Apr. 4
Greencastle, Ind	39 40	86 53												Apr. 4
Indianapolis, Ind	39 46	86 10	Apr. 29	Apr. 17	Apr. 1	May 4	May 13	Apr. 6	Apr. 7	Apr. 14	Apr. 12	Apr. 24	Apr. 6	Apr. 29
Cincinnati, Ohio	39 6	84 30	Apr. 29	Apr. 22	Apr. 19	Apr. 21	May 13	Apr. 21	Apr. 12	Mar. 24	Apr. 16	May 22	Mar. 10	Apr. 14
Columbus, Ohio	39 58	83 0						Apr. 12	Apr. 12	Apr. 7	May 1	Apr. 24	Apr. 9	Apr. 29
Pittsburg, Pa	40 32	80 2	Apr. 29	Apr. 23	May 1	Apr. 3	May 16	May 3	May 1	Apr. 15	May 8	May 17	Apr. 7	Apr. 29
Lower Lakes:														
Buffalo, N. Y	42 53	78 53	May 7	May 3	Apr. 26	May 5	Mar. 30	May 8	Mar. 31	Apr. 15	Apr. 25	Apr. 30	Apr. 30	May 3
Oswego, N. Y	43 29	76 35	May 6	Apr. 23	Apr. 29	Apr. 8	Mar. 26	Apr. 12	May 1	Apr. 15	Apr. 3	Apr. 29	Apr. 8	May 16
Rochester, N. Y	43 8	77 42	May 7	May 1	May 1	May 8	May 14	May 8	May 1	Apr. 15	May 3	May 17	Apr. 29	May 12
Erie, Pa	42 7	80 5	May 7	May 2	Apr. 29	May 3	Mar. 26	Apr. 12	Apr. 12	Apr. 15	May 2	Apr. 30	Apr. 12	May 2
Cleveland, Ohio	41 30	81 42	Apr. 29	May 17	May 1	Apr. 6	Mar. 26	Apr. 16	Mar. 31	May 4	Apr. 25	May 17	Apr. 21	Apr. 29
Sandusky, Ohio	41 25	82 40					Mar. 26	May 23	Mar. 31	Apr. 10	Apr. 12	(2)	Apr. 3	Apr. 14
Toledo, Ohio	41 40	83 34	Apr. 20	May 2	May 1	Apr. 4	Mar. 29	May 2	Apr. 12	Apr. 19	May 24	Apr. 29	Apr. 6	Apr. 14
Detroit, Mich	42 20	83 3	May 7	May 3	May 1	May 2	May 13	May 2	May 14	Apr. 9	May 2	Apr. 24	Apr. 7	Mar. 26
Upper Lakes:														
Alpena, Mich	45 5	83 30	May 6	May 16	May 8	May 6	May 15	May 7	May 1	Apr. 29	May 22	May 8	May 3	June 20

Escanaba, Mich	45 45	87 5	May 18	May 6	May 4	May 3	May 15	May 8	Apr. 30	May 6	May 16	Apr. 24	May 8	June 29
Grand Haven, Mich	43 5	86 13	Apr. 29	May 2	May 1	Apr. 5	May 11	May 7	Mar. 8	Apr. 16	Mar. 3	May 11	Apr. 21	June 10
Mackinaw City, Mich	45 47	84 39	....	....	....	....	....	....	....	....	....	Apr. 30	Apr. 29	May 11
Marquette, Mich	46 34	87 24	May 6	May 16	May 4	May 26	May 18	June 5	Apr. 30	June 6	June 11	May 23	May 28	May 28
Port Huron, Mich	43 0	82 26	....	May 3	May 1	May 7	May 12	May 2	Apr. 11	May 3	May 24	May 18	May 29	May 11
Chicago, Ill	41 52	87 38	Apr. 24	May 3	Apr. 30	Apr. 30	May 18	Apr. 3	Apr. 12	Apr. 7	May 25	Apr. 24	Apr. 3	May 10
Milwaukee, Wis	43 2	87 54	Apr. 23	May 3	May 1	May 3	Mar. 29	May 2	Mar. 30	Apr. 14	May 2	May 21	Apr. 20	May 11
Duluth, Minn	46 48	92 6	Apr. 23	May 16	May 6	May 2	May 12	May 7	Apr. 30	May 8	May 1	May 11	Apr. 29	June 8
Upper Mississippi Valley:														
Saint Paul, Minn	44 58	93 3	Apr. 26	May 5	May 4	Apr. 30	Apr. 6	Apr. 17	May 21	Apr. 16	May 23	Apr. 19	Apr. 21	May 7
La Crosse, Wis	43 49	91 15	Apr. 24	May 2	Apr. 18	May 1	May 13	May 2	Apr. 17	Apr. 14	May 23	May 21	Apr. 21	May 11
Davenport, Iowa	41 30	90 38	Apr. 23	May 6	May 1	Apr. 30	Mar. 28	Apr. 11	Apr. 1	Apr. 14	May 22	May 22	Apr. 22	May 9
Des Moines, Iowa	41 35	93 37	....	....	....	....	....	Apr. 18	Apr. 19	Mar. 24	Mar. 15	Apr. 2	Apr. 10	May 9
Dubuque, Iowa	42 30	90 44	Apr. 17	May 2	May 1	May 1	Mar. 20	May 16	Apr. 11	Apr. 16	May 23	May 21	Apr. 21	May 10
Keokuk, Iowa	40 22	91 26	Apr. 23	May 2	Apr. 2	Apr. 8	Mar. 4	Apr. 13	Apr. 17	Apr. 16	Mar. 22	Apr. 24	Apr. 8	Apr. 8
Cairo, Ill	37 0	89 10	Mar. 12	Apr. 17	Mar. 29	Apr. 30	Feb. 28	Apr. 8	Apr. 20	Apr. 14	Mar. 25	Mar. 22	Mar. 10	May 8
Springfield, Ill	39 48	89 39	....	....	....	....	....	....	Apr. 17	Apr. 14	May 16	May 22	Mar. 30	Apr. 10
Saint Louis, Mo	38 38	90 12	Apr. 29	May 2	Mar. 30	Apr. 30	Feb. 27	Mar. 13	Mar. 3	Apr. 14	Mar. 11	Mar. 29	Mar. 14	Apr. 4
Missouri Valley:														
Lamar, Mo	37 32	94 15	....	....	....	....	....	....	....	....	....	....	....	May 8
Leavenworth, Kans	39 19	94 57	Apr. 17	May 1	Apr. 5	Apr. 2	Apr. 4	Mar. 17	Mar. 20	Apr. 13	Mar. 16	Apr. 7	Apr. 8	Apr. 12
Omaha, Nebr	41 16	95 56	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	Apr. 7	Apr. 22	Apr. 12	Apr. 1	Apr. 10	May 7
Bennett, Fort, Dak	44 43	100 39	....	....	....	....	....	....	....	Apr. 1	May 22	May 12	May 1	Apr. 24
Huron, Dak	44 21	98 9	....	....	....	....	....	....	....	....	May 22	Apr. 30	May 2	June 22
Yankton, Dak	42 54	97 28	Apr. 23	May 2	Apr. 17	May 1	May 12	May 6	Apr. 30	Apr. 5	May 23	May 5	Apr. 23	May 10
Extreme Northwest:														
Moorhead, Minn	46 52	96 44	....	....	....	....	....	....	....	May 2	May 6	May 21	May 2	June 8
Saint Vincent, Minn	48 56	97 14	....	....	....	....	....	....	....	Apr. 29	May 26	June 2	May 20	June 8
Bismarck, Dak	46 47	100 38	....	June 3	May 5	May 3	May 15	May 6	Apr. 29	May 2	May 23	May 11	May 1	May 9
Buford, Fort, Dak	48 0	103 58	....	....	....	....	....	May 17	May 9	Apr. 28	May 28	June 2	May 5	May 11
Totten, Fort, Dak	47 57	98 57	....	....	....	....	....	....	....	....	....	....	....	May 17
Northern Slope:														
Assinaboine, Fort, Mont	48 32	109 42	....	....	....	....	....	....	....	May 23	May 10	June 1	May 4	May 8
Benton, Fort, Mont	47 50	110 40	Apr. 22	May 28	June 1	(2)	(2)	(2)	(2)	June 22	Apr. 19	May 6	May 13	Apr. 27
Custer, Fort, Mont	45 42	107 34	....	....	....	....	....	....	May 10	Apr. 13	May 23	May 30	May 13	May 8
Helena, Mont	46 34	112 4	....	....	....	....	....	....	June 9	Apr. 13	May 20	May 11	May 1	May 21
Maginnis, Fort, Mont	47 12	109 10	....	....	....	....	....	....	....	....	....	....	....	May 10
Poplar River, Mont	48 8	105 10	....	....	....	....	....	....	....	....	....	May 10	May 13	May 8
Shaw, Fort, Mont	47 31	111 48	....	....	....	....	....	....	May 15	May 16	May 10	May 5	May 21	May 11
Deadwood, Dak	44 23	103 43	....	....	....	....	May 19	Apr. 17	May 31	May 18	May 23	May 15	May 6	June 16
Cheyenne, Wyo	41 8	104 48	May 15	Apr. 30	June 19	June 9	May 20	June 2	May 31	May 18	May 21	June 13	May 14	May 19
North Platte, Nebr	41 8	100 45	....	May 1	Apr. 14	May 7	May 10	May 4	Apr. 30	Apr. 15	Apr. 23	May 3	May 2	May 12
Middle Slope:														
Denver, Colo	39 45	105 0	May 4	May 8	May 6	May 6	May 10	Apr. 17	May 11	Mar. 29	Apr. 18	May 26	May 5	May 11
Pike's Peak, Colo	38 50	105 2	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
West Las Animas, Colo	38 4	103 12	....	....	....	....	....	....	....	....	Apr. 23	Apr. 25	May 6	Apr. 25
Dodge City, Kans	37 45	100 0	....	Apr. 26	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 26	Apr. 14	Apr. 15	Apr. 25	May 2	Apr. 8
Elliott, Fort, Tex	35 30	100 21	....	....	....	....	....	....	Apr. 30	Apr. 13	Mar. 10	Apr. 6	Apr. 22	Apr. 25
Southern Slope:														
Sill, Fort, Ind. T	34 40	98 23	....	....	....	Mar. 25	Mar. 4	Apr. 4	Mar. 19	Apr. 13	Feb. 5	Mar. 20	(1)	Mar. 22

[1] No killing frost reported.

[2] No record.

[3] Frost every month in the year.

Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873–'74.	1874–'75.	1875–'76.	1876–'77.	1877–'78.	1878–'79.	1879–'80.	1880–'81.	1881–'82.	1882–'83.	1883–'84.	1884–'85.
Southern Slope—Continued:	° ′	° ′												
Concho, Fort, Tex	31 25	100 34	....	....	....	....	Mar. 4	Mar. 18	Apr. 9	Mar. 19	Mar. 9	Mar. 19	Mar. 14	Mar. 29
Davis, Fort, Tex	30 38	103 56	....	....	....	....	Apr. 8	Apr. 8	Apr. 9	Mar. 21	Apr. 15	Apr. 6	Apr. 22	Mar. 29
Stockton, Fort, Tex	30 53	102 53	....	....	....	....	Mar. 4	Mar. 19	Mar. 19	Apr. 14	Mar. 8	Apr. 15	Apr. 21	Feb. 11
Southern Plateau:														
El Paso, Tex	31 47	106 30	....	....	....	....	....	Apr. 10	Mar. 16	Apr. 14	Apr. 22	Apr. 16	Mar. 28	Mar. 7

APPPNDIX 44.

Dates of the first snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884–'85.

Stations.	Latitude.	Longitude.	Date.
	° ′	° ′	1884–'85.
New England:			
Eastport, Me	44 54	66 59	Oct. 14
Portland, Me	43 39	70 15	Oct. 16
Mount Washington, N. H	44 16	71 18	July 21
Boston, Mass	42 21	71 4	Oct. 31
Block Island, R. I	41 10	71 36	Dec. 12
New Haven, Conn	41 18	72 56	Nov. 18
New London, Conn	41 21	72 5	Nov. 19
Middle Atlantic States:			
Albany, N. Y	42 39	73 45	Oct. 25
New York City	40 43	74 0	Nov. 18
Philadelphia, Pa	39 57	75 9	Nov. 18
Atlantic City, N. J	39 22	74 25	Dec. 18
Barnegat City, N. J	39 46	74 6	Dec. 18
Cape May, N. J	38 56	74 58	Dec. 18
Sandy Hook, N. J	40 28	74 0	Dec. 18
Del. Breakwater Del	38 48	75 10	Dec. 18
Baltimore, Md	39 18	76 37	Nov. 3
Washington City	38 54	77 2	Nov. 6
Cape Henry, Va	36 56	76 0	Dec. 18
Chincoteague, Va	37 55	75 23	Dec. 18
Lynchburg, Va	37 25	79 9	Nov. 30
Norfolk, Va	36 51	76 17	Dec. 18
South Atlantic States:			
Charlotte, N. C	35 13	80 51	Mar. 17
Hatteras, N. C	35 15	75 40	Dec. 19
Kitty Hawk, N. C	36 0	75 42	Dec. 19
Macon, Fort, N. C	34 42	76 40	Mar. 18
Smithville, N. C	33 55	78 1	(1)
Wilmington, N. C	34 14	77 57	(1)
Charleston, S. C	32 47	79 56	(1)
Augusta, Ga	33 28	81 54	Feb. 12
Savannah, Ga	32 5	81 5	(1)
Jacksonville, Fla	30 20	81 39	(1)
Florida Peninsula:			
Cedar Keys, Fla	29 8	83 2	(1)
Key West, Fla	24 34	81 49	(1)
Sanford, Fla	28 48	81 23	(1)
Eastern Gulf States:			
Atlanta, Ga	33 45	84 23	Dec. 18
Pensacola, Fla	30 25	87 13	(1)
Mobile, Ala	30 41	88 2	(1)
Montgomery, Ala	32 23	86 18	Feb. 12
Vicksburg, Miss	32 22	90 53	Dec. 18
New Orleans, La	29 58	90 4	(1)
Western Gulf States:			
Shreveport, La	32 30	93 40	Jan. 16
Fort Smith, Ark	35 22	94 24	Dec. 18
Little Rock, Ark	34 45	92 6	Jan. 16
Galveston, Tex	29 18	94 47	(1)
Indianola, Tex	28 32	96 31	(1)
Palestine, Tex	31 45	95 40	Jan. 16
Rio Grande Valley:			
Brownsville, Tex	25 53	97 26	(1)
Rio Grande City, Tex	26 23	98 48	(1)
Ohio Valley and Tennessee:			
Chattanooga, Tenn	35 4	85 15	Dec. 18
Knoxville, Tenn	35 56	83 58	Dec. 18
Memphis, Tenn	35 9	90 3	Dec. 17
Nashville, Tenn	36 10	86 47	Nov. 28
Louisville, Ky	38 15	85 45	Nov. 18
Greencastle, Ind	39 40	86 53	Nov. 23
Indianapolis, Ind	39 46	86 10	Nov. 5
Cincinnati, Ohio	39 6	84 30	Nov. 18
Columbus, Ohio	39 58	83 0	Oct. 23
Pittsburg, Pa	40 32	80 2	Oct. 23
Lower Lakes:			
Buffalo, N. Y	42 53	78 53	Oct. 23
Oswego, N. Y	42 29	76 35	Oct. 23
Rochester, N. Y	43 8	77 42	Oct. 23
Erie, Pa	42 7	80 5	Oct. 23
Cleveland, Ohio	41 30	81 42	Oct. 23
Sandusky, Ohio	41 25	82 40	Oct. 23
Toledo, Ohio	41 40	83 34	Oct. 23
Detroit, Mich	42 20	83 3	Oct. 23
Upper Lakes:			
Alpena, Mich	45 5	83 30	Oct. 23
Escanaba, Mich	45 48	87 5	Oct. 22
Grand Haven, Mich	43 5	86 18	Oct. 22
Mackinaw City, Mich	45 47	84 39	Oct. 22
Marquette, Mich	46 34	87 24	Oct. 22
Port Huron, Mich	43 0	82 26	Oct. 23
Chicago, Ill	41 52	87 38	Oct. 23
Milwaukee, Wis	43 2	87 54	Oct. 24
Duluth, Minn	46 48	92 6	Oct. 20
Upper Mississippi Valley:			
Saint Paul, Minn	44 58	93 3	Oct. 22
La Crosse, Wis	43 49	91 15	Oct. 22
Davenport, Iowa	41 30	90 38	Nov. 4
Des Moines, Iowa	41 35	93 37	Nov. 22
Dubuque, Iowa	42 30	90 44	Oct. 22
Keokuk, Iowa	40 22	91 26	Nov. 17
Cairo, Ill	37 0	89 10	Nov. 27
Springfield, Ill	39 48	89 39	Nov. 17
Saint Louis, Mo	38 38	90 12	Nov. 18
Missouri Valley:			
Leavenworth, Kans	39 19	94 57	Nov. 17
Omaha, Nebr	41 16	95 56	Nov. 18
Bennett, Fort, Dak	44 48	100 39	Oct. 20
Huron, Dak	44 21	98 9	Oct. 20
Yankton, Dak	42 54	97 28	Oct. 7
Extreme Northwest:			
Moorhead, Minn	46 52	96 44	Oct. 21
Saint Vincent, Minn	48 56	97 14	Oct. 21
Bismarck, Dak	46 47	100 38	Nov. 1
Buford, Fort, Dak	48 0	103 56	Oct. 21
Totten, Fort, Dak	47 57	98 57	Oct. 26
Northern Slope:			
Assinaboine, Fort, Mont	48 32	109 42	Oct. 3
Benton, Fort, Mont	47 50	110 40	Oct. 2
Custer, Fort, Mont	45 42	107 34	Oct. 19
Helena, Mont	46 34	112 4	Oct. 1
Maginnis, Fort, Mont	47 12	109 10	Sept. 6
Poplar River, Mont	48 8	105 10	Oct. 20
Shaw, Fort, Mont	47 31	111 48	Oct. 2
Deadwood, Dak	44 23	103 43	Sept. 29
Cheyenne, Wyo	41 8	104 48	Oct. 26
North Platte, Nebr	41 8	100 45	Oct. 7
Middle Slope:			
Denver, Colo	39 45	105 0	Oct. 7
Pike's Peak, Colo	38 50	105 2	(2)
West Las Animas, Colo	38 4	103 12	Nov. 17
Dodge City, Kans	37 45	100 0	Nov. 17
Elliott, Fort, Tex	35 30	100 21	Dec. 10
Southern Slope:			
Sill, Fort, Ind. T	34 40	98 23	Dec. 11
Concho, Fort, Tex	31 25	100 34	Jan. 15
Davis, Fort, Tex	30 38	103 56	Dec. 11
Stockton, Fort, Tex	30 53	102 53	Jan. 4
Southern Plateau:			
El Paso, Tex	31 47	106 30	Dec. 11

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[1] No snow observed.

[2] Snow every month in the year.

APPENDIX 45.

Dates of the last snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884–'85.

Stations.	Latitude.	Longitude.	Date.
New England:	° ′	° ′	1884–'85
Eastport, Me	44 51	66 59	May 2
Portland, Me	43 39	70 15	May 2
Mount Washington, N. H	44 16	71 18	(1)
Boston, Mass	42 21	71 4	Apr. 2
Block Island, R. I	41 10	71 36	Mar. 29
New Haven, Conn	41 18	72 56	Apr. 11
New London, Conn	41 21	72 5	Mar. 29
Middle Atlantic States:			
Albany, N. Y	42 39	73 45	May 1
New York City	40 43	74 0	Apr. 29
Philadelphia, Pa	39 57	75 9	Apr. 15
Atlantic City, N. J	39 22	74 25	Apr. 11
Barnegat City, N. J	39 46	74 6	Apr. 29
Cape May, N. J	38 56	74 58	Mar. 22
Sandy Hook, N. J	40 28	74 0	Apr. 11
Baltimore, Md	39 18	76 37	Apr. 11
Washington City	38 54	77 2	Apr. 11
Cape Henry, Va	36 56	76 0	Apr. 10
Chincoteague, Va	37 55	75 23	Mar. 22
Lynchburg, Va	37 25	79 9	Apr. 13
Norfolk, Va	36 51	76 17	Apr. 13
South Atlantic States:			
Charlotte, N. C	35 13	80 51	Mar. 23
Hatteras, N. C	35 15	75 40	Mar. 23
Kitty Hawk, N. C	36 0	75 42	Mar. 23
Macon, Fort, N. C	34 42	76 40	Mar. 23
Smithville, N. C	33 55	78 1	(2)
Wilmington, N. C	34 14	77 57	Mar. 23
Charleston, S. C	32 47	79 56	(2)
Augusta, Ga	33 28	81 54	Mar. 23
Savannah, Ga	32 5	81 5	(2)
Jacksonville, Fla	30 20	81 39	(2)
Florida Peninsula:			
Cedar Keys, Fla	29 8	83 2	(2)
Key West, Fla	24 34	81 49	(2)
Sanford, Fla	28 48	81 23	(2)
Eastern Gulf States:			
Atlanta, Ga	33 45	84 23	Mar. 18
Pensacola, Fla	30 25	87 13	(2)
Mobile, Ala	30 41	88 2	(2)
Montgomery, Ala	32 23	86 18	Feb. 12
Vicksburg, Miss	32 22	90 53	Feb. 12
New Orleans, La	29 58	90 4	(2)
Western Gulf States.			
Shreveport, La	32 30	93 40	Feb, 21
Fort Smith, Ark	35 22	94 24	Feb. 16
Little Rock, Ark	34 45	92 6	Feb. 16
Galveston, Tex	29 18	94 47	(2)
Indianola, Tex	28 32	96 31	(2)
Palestine, Tex	31 45	95 40	Feb. 13
Rio Grande Valley:			
Brownsville, Tex	25 53	97 26	(2)
Rio Grande City, Tex	26 23	98 48	(2)
Ohio Valley and Tennessee:			
Chattanooga, Tenn	35 4	85 15	Mar. 18
Knoxville, Tenn	35 56	83 58	Apr. 13
Memphis, Tenn	35 9	90 3	Mar. 8
Nashville, Tenn	36 10	86 47	Mar. 28
Louisville, Ky	38 15	85 45	Apr. 14
Greencastle, Ind	39 40	86 53	Apr. 14
Indianapolis, Ind	39 46	86 10	Apr. 14
Cincinnati, Ohio	39 6	84 30	Mar. 28
Columbus, Ohio	39 58	83 0	Apr. 15
Pittsburg, Pa	40 32	80 2	May 10
Lower Lakes:			
Buffalo, N. Y	42 53	78 53	May 9
Lower Lakes—Cont'd:	° ′	° ′	1884–'85
Oswego, N. Y	43 29	76 35	May 10
Rochester, N. Y	43 8	77 42	May 10
Erie, Pa	42 7	80 5	May 9
Cleveland, Ohio	41 30	81 42	May 9
Sandusky, Ohio	41 25	82 40	May 9
Toledo, Ohio	41 40	83 34	May 9
Detroit, Mich	42 20	83 3	Apr. 14
Upper Lakes:			
Alpena, Mich	45 5	83 30	May 10
Escanaba, Mich	45 48	87 5	May 10
Grand Haven, Mich	43 5	86 18	May 8
Mackinaw City, Mich	45 47	84 39	May 8
Marquette, Mich	46 34	87 24	May 10
Port Huron, Mich	43 0	82 26	May 9
Chicago, Ill	41 52	87 38	Apr. 14
Milwaukee, Wis	43 2	87 54	Apr. 14
Duluth, Minn	46 48	92 6	May 7
Upper Mississippi Valley:			
Saint Paul, Minn	44 58	93 3	May 8
La Crosse, Wis	43 49	91 15	May 9
Davenport, Iowa	41 30	90 38	Apr. 12
Des Moines, Iowa	41 35	93 37	Apr. 9
Dubuque, Iowa	42 30	90 44	May 7
Keokuk, Iowa	40 22	91 26	Apr. 9
Cairo, Ill	37 0	89 10	Mar. 28
Springfield, Ill	39 48	89 30	Apr. 9
Saint Louis, Mo	38 38	90 12	Apr. 9
Missouri Valley:			
Lamar, Mo	37 32	94 15	May 7
Leavenworth, Kans	39 19	94 57	Mar. 28
Omaha, Nebr	41 16	95 56	Apr. 9
Bennett, Fort, Dak	44 43	100 39	May 6
Huron, Dak	44 21	98 9	May 6
Yankton, Dak	42 54	97 28	May 7
Extreme Northwest:			
Moorhead, Minn	46 52	96 44	May 8
Saint Vincent, Minn	48 56	97 14	May 8
Bismarck, Dak	46 47	100 38	May 7
Buford, Fort, Dak	48 0	103 56	May 6
Totten, Fort, Dak	47 57	98 57	May 7
Northern Slope:			
Assinaboine, Fort, Mont	48 32	109 42	May 7
Benton, Fort, Mont	47 50	110 40	Apr. 20
Custer, Fort, Mont	45 42	107 34	Apr. 21
Helena, Mont	46 34	112 4	June 7
Maginnis, Fort, Mont	47 12	109 10	May 6
Poplar River, Mont	48 8	105 10	May 7
Shaw, Fort, Mont	47 31	111 48	May 6
Deadwood, Dak	44 23	103 43	May 10
Cheyenne, Wyo	41 8	104 48	May 7
North Platte, Nebr	41 8	100 45	Mar. 27
Middle Slope:			
Denver, Colo	39 45	105 0	May 11
Pike's Peak, Colo	38 50	105 2	(1)
West Las Animas, Colo	38 4	103 12	Apr. 26
Dodge City, Kans	37 45	100 0	May 7
Elliott, Fort, Tex	35 30	100 31	Mar. 24
Southern Slope:			
Sill, Fort, Ind. T	34 40	98 23	Feb. 12
Concho, Fort, Tex	31 25	100 34	Feb. 13
Davis, Fort, Tex	30 38	103 56	Feb. 13
Stockton, Fort, Tex	30 53	102 53	Feb. 13
Southern Plateau:			
El Paso, Tex	31 47	106 30	(2)

[1] Snow every month in the year.

[2] No snow observed.

APPENDIX 46.

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year. (Compiled from the commencement of observations at each to and including December, 1884.)

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
		Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*
New England:														
Eastport, Me	Apr. 1, 1873	9,207.8	8,517.8	9,536.8	7,251.2	6,212.1	4,794.7	4,673.8	4,251.8	5,854.7	7,148.0	8,476.5	8,771.0	84,278.5
Portland, Me	Jan. 15, 1871	5,750.7	5,673.5	6,767.3	6,868.7	5,792.4	4,946.2	4,924.7	4,815.7	4,815.5	5,485.4	5,998.1	5,895.6	67,346.4
Boston, Mass	Nov. 1, 1870	7,849.2	7,205.7	8,444.2	7,272.0	6,558.5	5,602.4	5,538.9	5,308.9	5,917.1	6,719.9	7,392.2	7,447.9	81,909.3
Block Island, R. I	Sept. 1, 1880	13,073.0	11,153.2	12,893.2	10,495.2	10,430.2	8,820.0	8,641.5	7,695.5	9,897.8	11,242.6	11,938.8	13,038.0	129,388.0
New Haven, Conn	Dec. 10, 1872	5,931.4	5,612.1	6,976.3	6,503.2	5,489.8	4,591.2	4,506.5	4,331.5	4,882.4	5,480.3	5,841.8	5,908.5	66,096.9
New London, Conn	Jan. 10, 1871	5,755.5	5,818.4	6,784.6	6,026.8	5,294.3	4,367.6	4,264.9	3,967.1	4,410.8	5,254.4	5,764.2	5,655.7	63,607.2
Middle Atlantic States:														
Albany, N. Y	Dec. 22, 1873	5,787.9	5,618.0	6,515.6	6,019.6	5,186.4	4,227.7	3,831.9	3,319.8	3,615.0	4,522.7	5,168.8	5,427.4	59,240.9
New York City	Nov. 1, 1870	7,380.8	7,388.7	8,654.4	7,235.8	6,556.6	5,780.2	5,734.0	5,570.6	6,272.3	6,968.1	7,302.6	7,602.6	82,446.8
Philadelphia, Pa	Jan. 1, 1871	7,588.2	7,308.2	8,815.8	7,996.8	7,187.8	6,461.5	6,240.0	5,629.1	5,946.5	6,918.9	6,955.5	7,485.1	84,123.4
Atlantic City, N. J	Dec. 10, 1873	7,271.5	7,273.7	8,686.2	8,214.2	7,384.8	6,810.4	5,654.3	6,614.2	7,307.5	7,061.0	6,885.4	7,148.0	85,404.8
Barnegat City, N. J	Dec. 10, 1873	10,100.4	9,514.8	11,277.4	9,867.0	8,913.5	7,845.7	7,364.4	7,989.0	8,920.5	9,424.6	9,812.5	9,913.2	111,242.7
Cape May, N. J	May 24, 1871	10,892.7	11,040.6	12,268.9	10,631.5	9,409.2	7,916.7	7,611.4	7,323.2	8,499.0	10,216.7	11,352.0	11,883.4	122,130.9
Sandy Hook, N. J	Dec. 10, 1873	11,207.5	9,999.6	12,886.6	10,465.9	9,254.2	8,580.4	8,264.9	8,314.5	9,892.9	11,096.6	11,835.2	12,555.1	123,883.5
Del. Breakwater, Del	Jan. 28, 1880	12,490.2	12,248.4	14,371.0	11,861.8	11,512.6	9,954.0	9,014.4	9,094.2	10,910.8	11,892.6	12,230.6	12,746.0	137,675.0
Baltimore, Md	Jan. 1, 1871	4,165.9	4,128.3	5,227.6	4,947.4	4,476.2	4,263.3	4,153.1	3,640.0	3,764.4	3,941.7	3,962.6	4,215.4	51,023.5
Washington City	Nov. 1, 1870	4,703.1	4,776.7	6,344.2	5,752.6	4,804.0	4,238.8	4,048.8	3,535.7	3,814.6	4,035.8	4,411.5	4,817.5	55,755.4
Cape Henry, Va	Dec. 15, 1873	9,564.5	9,159.1	10,837.1	9,848.5	8,728.1	7,983.5	7,326.5	7,810.3	9,009.8	9,678.9	9,785.9	10,046.0	110,020.2
Chincoteague, Va	Mar. 16, 1880	9,139.5	8,880.8	10,681.8	10,004.6	9,228.4	7,678.6	7,168.6	7,280.2	7,986.6	9,210.6	9,267.4	8,684.4	100,194.5
Lynchburg, Va	May 24, 1871	2,767.8	3,007.9	3,830.4	3,855.8	2,886.2	2,323.7	2,269.7	2,020.3	1,889.2	2,141.2	2,825.2	2,727.2	31,378.0
Norfolk, Va	Jan. 1, 1871	5,588.2	5,853.1	6,917.0	6,267.2	5,795.1	5,271.6	4,994.6	4,741.5	4,757.9	5,330.1	5,452.5	5,654.5	67,169.8
South Atlantic States:														
Charlotte, N. C	Oct. 6, 1878	3,890.0	4,308.5	4,938.8	4,498.2	3,868.7	3,745.2	3,395.8	3,354.3	3,447.3	3,674.5	3,594.2	3,804.6	46,436.8
Hatteras, N. C	Dec. 1, 1880	11,094.2	11,077.2	12,599.8	12,032.5	10,906.8	10,492.8	10,180.5	9,784.5	9,542.2	10,114.8	9,258.5	10,320.8	127,404.5
Kitty Hawk, N. C	Jan. 15, 1875	11,347.7	10,872.3	11,797.9	11,526.6	10,754.9	9,705.8	9,087.1	9,257.3	10,686.8	11,216.4	11,600.7	11,553.0	128,644.3
Macon, Fort, N. C	May 23, 1878	9,414.5	9,280.0	10,699.0	9,670.0	9,312.8	8,920.0	8,405.8	8,650.5	9,305.5	9,990.0	9,040.0	9,510.0	114,958.7
Smithville, N. C	Oct. 15, 1875	6,407.3	6,624.0	8,117.2	7,733.2	7,364.2	7,740.9	7,863.6	6,770.7	6,618.6	6,818.9	6,083.8	6,477.8	84,120.1
Wilmington, N. C	Jan. 1, 1871	5,326.5	5,272.8	6,784.6	6,261.9	5,347.9	5,072.4	4,939.6	4,222.8	4,232.9	4,557.8	4,847.5	5,415.9	62,910.6
Charleston, S. C	Jan. 5, 1871	5,479.8	5,498.0	6,546.7	6,213.3	6,483.5	5,905.4	5,679.5	5,378.7	5,626.0	5,692.0	5,851.6	5,258.4	70,514.3
Augusta, Ga	Nov. 2, 1870	2,609.8	2,924.5	3,611.2	3,197.1	2,957.8	2,786.5	2,432.2	2,288.2	2,460.2	2,656.8	2,621.3	2,456.7	33,079.2
Savannah, Ga	Jan. 1, 1871	4,683.5	4,814.4	5,863.8	5,664.1	5,528.9	4,544.4	4,297.1	4,025.4	4,103.7	4,514.1	4,528.5	4,634.3	58,383.9
Jacksonville, Fla	Sept. 11, 1871	4,249.1	4,637.5	5,904.4	5,466.5	5,009.8	4,908.8	4,761.0	4,321.5	4,596.6	5,104.6	4,598.7	4,481.4	58,496.2
Florida Peninsula:														
Cedar Keys, Fla	Nov. 7, 1879	6,700.6	6,418.6	8,235.4	7,478.4	7,229.4	6,730.2	6,234.0	6,394.8	5,999.0	6,936.8	5,700.2	6,245.5	80,857.8
Key West, Fla	Nov. 1, 1870	8,112.0	6,979.8	8,329.3	7,549.7	6,985.1	5,522.2	5,555.6	5,443.7	5,872.0	8,760.0	8,071.9	8,249.4	85,590.0
Sanford, Fla	Sept. 1, 1882	5,972.0	4,580.0	5,451.0	4,987.0	4,418.0	4,056.0	3,598.5	3,425.0	4,446.0	5,614.0	5,337.5	3,710.5	56,103.0

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations:	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
		Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*
Eastern Gulf States:														
Atlanta, Ga	Sept. 25, 1878	7,843.8	7,658.2	8,340.3	6,600.7	5,967.3	5,442.8	5,470.7	5,297.8	5,540.8	6,477.0	6,705.7	7,387.5	78,732.7
Pensacola, Fla	Oct. 27, 1879	5,386.0	5,656.0	6,426.2	6,414.6	6,261.4	5,859.6	5,026.4	5,045.4	4,813.4	5,647.0	5,337.2	5,515.9	67,474.8
Mobile, Ala	Nov. 7, 1870	4,556.2	4,481.8	5,165.3	4,974.8	4,675.5	4,104.2	3,989.2	3,781.5	4,188.7	4,661.7	4,333.5	4,367.2	53,362.0
Montgomery, Ala	Nov. 9, 1870	4,059.4	4,195.0	4,851.9	4,217.1	3,642.6	3,381.5	3,138.3	2,883.6	3,216.0	3,543.6	3,660.5	3,929.0	46,072.1
Vicksburg, Miss	Sept. 10, 1871	4,496.4	4,408.3	5,097.8	4,808.2	3,885.0	3,224.2	3,071.8	2,851.8	2,848.8	3,586.1	4,405.9	4,709.7	47,596.9
New Orleans, La	Nov. 1, 1870	5,862.5	5,808.9	6,360.8	5,951.8	5,152.2	4,328.0	4,287.7	4,087.6	5,078.1	5,442.2	5,718.0	6,056.1	64,606.1
Western Gulf States:														
Shreveport, La	Sept. 3, 1871	3,818.5	4,013.0	4,712.8	4,634.7	3,890.9	3,248.2	3,127.9	2,752.6	2,923.8	3,142.4	3,499.0	3,756.2	43,520.6
Fort Smith, Ark	June 1, 1882	4,459.0	4,318.5	4,933.0	4,637.5	4,060.0	2,783.3	2,841.3	2,693.7	2,855.7	3,237.0	3,332.0	4.316.0	43,982.0
Little Rock, Ark	July 1, 1879	4,081.4	4,190.8	5,053.8	4,714.4	3,862.2	3,119.4	3,284.5	2,829.5	2,715.8	3,558.0	3,333.0	4,130.3	45,042.0
Galveston, Tex	Apr. 19, 1871	7,779.8	7,269.0	7,576.2	7,916.5	7,311.2	6,079.5	5,800.6	5,283.1	6,481.2	7,076.9	7,869.1	7,835.1	85,334.7
Indianola, Tex	May 1, 1872	10,425.8	9,985.5	10,651.2	11,824.2	9,722.5	8,236.7	8,068.5	7,075.5	7,959.5	8,727.5	10,132.3	10,425.1	112,673.5
Palestine, Tex	Dec. 3, 1881	6,319.0	7,684.0	7,815.5	7,411.8	6,745.7	4,917.7	6,052.3	5,034.7	5,551.7	6,828.8	6,362.3	7,157.0	76,072.0
Rio Grande Valley:														
Brownsville, Tex	Aug. 25, 1875	5,405.4	5,928.9	6,326.4	6,604.9	5,771.2	5,141.6	5,392.0	3,896.1	3,838.5	3,864.0	4,918.1	5,362.5	61,869.6
Rio Grande City, Tex	May 28, 1875	5,252.6	5,450.8	5,741.3	6,722.8	7,160.0	6,931.4	7,917.0	5,439.7	4,874.7	4,524.2	4,531.0	4,292.8	70,665.2
Ohio Valley & Tennessee:														
Chattanooga, Tenn	Jan. 8, 1879	4,532.2	5,184.8	5,767.0	5,168.2	4,068.7	3,632.7	3,511.5	3,305.7	3,194.7	3,532.5	3,928.8	4,682.2	50,492.8
Knoxville, Tenn	Jan. 1, 1871	4,498.2	4,619.6	5,636.8	5,112.1	4,336.7	3,803.9	3,509.6	3,153.9	3,179.9	3,242.8	3,796.2	4,283.7	49,126.5
Memphis, Tenn	Feb. 28, 1871	4,508.2	4,019.2	4,948.5	4,828.8	3,656.4	3,468.5	3,301.2	3,005.3	3,209.8	3,029.5	4,207.3	4,411.8	47,451.5
Nashville, Tenn	Nov. 1, 1870	3,452.8	3,461.5	4,125.4	3,823.4	3,251.9	2,809.8	2,602.1	2,433.4	2,548.6	2,917.0	3,284.6	3,532.7	39,828.7
Louisville, Ky	Sept. 11, 1871	5,767.9	5,809.6	6,670.5	5,993.3	5,195.6	4,882.8	4,252.8	3,996.8	4,318.7	4,869.0	5,357.1	5,639.6	62,899.0
Indianapolis, Ind	Feb. 10, 1871	4,787.8	4,417.2	5,512.0	5,026.9	4,276.2	3,669.8	3,215.7	3,327.4	3,366.8	3,791.9	4,150.0	4,658.8	49,969.4
Cincinnati, Ohio	Nov. 1, 1870	4,710.6	4,605.9	5,530.1	4.818.8	4,305.2	3,938.8	3,502.5	3,196.2	3,436.0	3,888.4	4,801.2	4,575.8	51,098.1
Columbus, Ohio	July 1, 1878	6,018.8	6,224.3	6,963.0	6,163.2	5,255.5	4,806.2	4,296.5	3,737.9	4,219.9	4,701.0	5,631.6	6,065.1	63,956.8
Pittsburg, Pa	Nov. 1, 1870	5,075.4	4,642.8	5,601.8	4,782.0	4,125.3	3,963.8	3,799.0	3,278.6	3,563.6	4,031.5	4,796.9	5,150.9	52,921.2
Lower Lakes:														
Buffalo, N. Y	Nov. 1, 1870	8,519.5	7,352.2	7,747.9	6,248.1	5,906.5	5,182.2	5,416.2	4,935.8	5,800.5	6,854.5	7,921.3	9,029.6	80,964.5
Oswego, N. Y	Nov. 1, 1870	7,945.9	7,401.8	7,677.2	6,305.5	5,652.0	4,582.7	4,701.6	4,432.9	5,325.4	6,480.8	7,631.4	8,086.1	76,152.1
Rochester, N. Y	Nov. 1, 1870	8,548.2	7,834.5	8,669.6	7,548.4	7,298.1	5,976.8	5,751.6	5,238.4	6,008.4	6,789.8	7.524.9	8,034.8	83,437.4
Erie, Pa	May 25, 1873	8,718.2	7,923.9	8,354.6	7,706.7	6,612.2	5,959.5	5,479.3	5,280.9	6,809.3	7,667.0	9,008.9	9,575.8	88,595.8
Cleveland, Ohio	Nov. 1, 1870	8,058.8	6,955.3	7,958.5	6,645.1	6,226.9	5,648.2	5,454.5	5,128.2	6,271.2	7,257.9	8,114.5	8,246.5	83,783.8
Sandusky, Ohio	Aug. 2, 1877	9,648.9	9,488.9	10,930.0	10,253.8	9,467.7	8,599.0	7,684.7	7,608.3	8,426.6	9,652.4	10,414.6	10,094.8	111,817.8
Toledo, Ohio	Nov. 1, 1870	7,008.6	6,147.6	7,232.5	6,811.8	6,819.2	5,527.6	5,040.6	4,881.6	5,314.8	6,277.1	6,612.2	6,929.8	75,052.0
Detroit, Mich	Nov. 1, 1870	6,250.9	5,867.7	6,728.3	6,168.7	5,945.3	4,970.1	4,868.8	4,624.4	4,988.8	5,882.9	6,094.4	6,420.9	68,818.8
Upper Lakes:														
Alpena, Mich	Sept. 10, 1872	6,889.8	6,849.2	7,621.1	6,717.6	6,252.7	5,606.1	5,592.8	5,308.8	6,046.8	6,755.3	6,906.0	6,997.5	79,043.0
Escanaba, Mich	May 24, 1871	7,023.2	6,665.9	7,768.2	7,238.3	6,695.2	6,007.9	6,081.2	5,780.9	7,000.1	7,825.9	7,072.7	7,189.1	82,330.7
Grand Haven, Mich	May 24, 1871	8,691.2	8,276.5	8,931.2	8,448.5	7,876.7	6,447.3	6,275.8	6,087.7	7,177.2	8,802.2	8,829.2	9,024.2	95,636.7
Mackinaw City, Mich	Aug. 20, 1882	8,490.5	7,015.0	6,798.5	6,819.0	6,971.0	5,520.5	6,208.5	6,162.0	6,774.7	8,177.7	8,550.0	8,860.7	86,256.0

Marquette, Mich	May 1, 1871	6,978.8	6,061.6	6,829.5	5,995.7	6,425.8	4,968.1	5,093.8	6,241.2	6,198.8	6,921.1	6,816.7	7,202.7	78,756.7
Port Huron, Mich	July 25, 1874	7,675.4	7,249.4	7,959.6	7,718.5	7,434.6	5,970.0	5,777.7	5,404.5	6,039.4	7,030.8	7,470.3	7,788.5	83,446.6
Chicago, Ill	Nov. 1, 1870	6,692.8	6,115.9	7,244.2	6,817.5	6,887.8	5,496.2	5,229.4	5,126.8	5,605.9	6,248.8	6,137.6	6,434.3	74,614.7
Milwaukee, Wis	Nov. 1, 1870	8,814.2	8,820.6	9,571.1	8,562.5	7,878.6	6,721.8	6,842.2	6,685.5	7,218.9	8,440.9	8,601.2	9,127.5	96,839.0
Duluth, Minn	Nov. 1, 1870	4,900.2	5,209.8	5,852.0	6,363.6	5,230.6	4,457.2	5,019.3	4,882.7	5,458.9	5,948.6	5,881.0	5,250.1	64,036.8
Upper Mississippi Valley:														
Saint Paul, Minn	Nov. 1, 1870	5,704.4	5,461.3	6,585.3	6,955.7	7,012.5	6,016.8	5,826.8	5,314.5	5,918.5	6,529.8	5,750.4	5,578.2	72,535.6
La Crosse, Wis	Oct. 15, 1871	5,144.2	5,267.3	6,215.6	6,256.0	5,829.8	5,127.8	4,655.2	4,596.0	5,052.8	5,832.9	5,456.8	5,147.3	64,578.0
Davenport, Iowa	May 24, 1871	6,308.9	6,104.7	7,646.6	7,595.4	6,768.5	5,507.8	4,947.8	4,794.2	5,550.0	6,018.8	6,222.6	6,142.9	72,860.5
Des Moines, Iowa	Aug. 1, 1878	4,815.8	5,044.7	5,969.2	6,011.0	4,902.0	4,218.8	3,713.0	3,464.5	4,060.8	4,371.5	4,648.7	4,710.0	55,930.5
Dubuque, Iowa	July 10, 1872	3,616.1	3,780.6	4,816.5	5,068.6	4,406.8	3,824.2	3,248.5	3,155.0	3,349.2	3,957.5	3,764.7	3,562.4	46,637.6
Keokuk, Iowa	July 16, 1871	6,018.8	5,676.1	7,060.9	7,268.6	6,457.3	5,258.2	4,625.7	4,679.5	5,412.6	5,811.6	5,940.0	5,648.3	69,861.6
Cairo, Ill	June 1, 1871	5,808.2	5,840.6	7,457.6	6,472.5	5,599.3	4,693.2	3,919.0	3,638.4	4,155.9	4,933.8	5,639.0	5,806.1	64,500.6
Springfield, Ill	July 1, 1879	7,108.6	7,063.4	8,011.0	7,394.8	6,824.4	5,272.2	4,535.0	4,912.0	5,747.0	6,051.0	6,781.2	6,884.7	76,198.4
Saint Louis, Mo	Nov. 1, 1870	7,834.9	7,144.8	8,761.9	7,879.8	7,276.0	6,423.4	5,815.2	5,596.4	6,234.6	7,075.7	7,674.6	7,725.7	86,188.4
Missouri Valley:														
Leavenworth, Kans	May 21, 1871	5,879.7	5,221.5	6,889.5	6,655.4	5,651.9	4,968.8	4,053.0	3,919.4	4,671.2	4,888.6	5,208.6	5,047.8	62,283.8
Omaha, Nebr	Nov. 1, 1870	6,837.9	6,450.5	7,864.9	7,625.4	6,926.4	5,740.0	5,214.8	5,096.5	5,649.5	6,438.3	6,889.6	6,596.7	77,587.8
Bennett, Fort, Dak	Dec. 22, 1879	4,899.5	4,282.7	5,964.7	6,915.2	7,195.5	6,043.2	5,814.2	6,657.7	6,287.0	5,876.0	5,068.0	4,593.6	66,436.5
Huron, Dak	July 1, 1881	8,075.0	7,294.8	8,440.0	8,898.0	8,375.0	6,704.8	7,043.8	6,987.2	7,702.5	7,614.5	7,210.2	6,984.0	89,137.3
Yankton, Dak	April 1, 1873	6,496.1	6,411.4	7,899.5	8,618.8	7,898.8	6,732.1	5,246.0	5,259.5	5,853.3	6,867.3	6,397.3	6,031.1	79,507.0
Extreme Northwest:														
Moorhead, Minn	Jan. 1, 1881	8,366.5	7,459.8	8,743.7	8,017.2	8,672.8	7,887.0	6,915.8	7,437.5	7,784.0	8,117.2	7,941.8	7,998.5	91,663.0
Saint Vincent, Minn	Sept. 5, 1880	7,228.0	6,504.0	7,195.8	6,808.8	7,122.8	5,934.0	5,833.0	5,536.0	6,987.2	6,884.6	7,266.2	7,227.8	78,597.0
Bismarck, Dak	Sept. 15, 1874	5,977.1	5,794.9	6,998.0	8,137.9	7,741.7	6,657.3	6,681.7	6,387.4	6,511.4	7,127.2	6,259.1	5,911.8	80,322.4
Buford, Fort, Dak	Oct. 23, 1878	5,118.0	4,903.8	6,046.7	7,390.8	7,119.8	6,229.7	6,625.0	6,780.7	6,306.0	6,692.8	5,910.5	5,183.5	74,533.2
Northern Slope:														
Assinaboine, Fort, Mont	Oct. 6, 1879	8,149.2	7,982.2	7,224.0	7,476.8	7,208.3	7,030.3	7,630.7	6,500.8	6,447.5	7,803.8	8,532.4	8,198.8	91,624.7
Benton, Fort, Mont	Oct. 11, 1879	5,405.2	5,834.5	5,604.5	5,675.2	5,820.7	5,017.0	5,037.5	4,336.4	4,862.8	5,454.4	5,925.2	5,568.0	54,560.5
Custer, Fort, Mont	Dec. 5, 1878	4,992.5	4,876.0	5,829.5	6,162.2	5,978.0	4,938.5	5,189.8	5,122.8	4,787.2	5,115.8	4,638.2	4,931.2	65,583.0
Helena, Mont	Oct. 15, 1879	3,450.2	3,362.0	4,624.2	4,470.6	4,991.6	4,693.4	4,671.8	4,160.6	3,959.2	4,026.2	3,568.8	3,415.8	50,697.2
Maginnis, Fort, Mont	July 14, 1882	11,342.5	8,199.0	7,058.0	7,482.0	7,644.0	7,313.0	7,889.5	6,997.0	6,838,7	8,846.7	9,760.7	9,300.0	96,191.5
Shaw, Fort, Mont	April 1, 1880	8,370.5	8,431.8	7,645.5	6,743.0	6,734.8	5,945.2	5,656.6	4,920.0	5,695.2	7,386.8	7,951.0	8,297.8	83,312.0
Deadwood, Dak	Dec. 25, 1877	2,990.1	2,467.3	2,839.7	2,899.1	3,152.7	3,254.6	3,161.0	3,165.5	2,953.2	3,205.2	2,518.4	2,719.1	35,143.6
Cheyenne, Wyo	Nov. 1, 1870	9,618,6	8,417.7	9,295.3	8,496.9	7,796.8	6,640.9	6,616.6	6,041.2	6,427.6	7,407.0	7,947.8	8,297.1	92,880.1
North Platte, Nebr	Sept. 18, 1874	7,260.3	6,678.5	9,044.3	9,677.2	10,201.0	9,090.5	8,808.3	8,354.9	8,309.9	8,421.1	7,163.6	6,650.7	100,188.1
Middle Slope:														
Denver, Colo	Nov. 19, 1871	4,780.8	4,170.0	5,439.5	5,253.1	5,062.2	4,595.7	4,574.1	4,200.9	4,007.7	4,413.5	4,391.6	4,400.9	55,299.0
Pike's Peak, Colo	Nov. 1, 1873	18,622.6	17,146.6	18,789.6	15,849.2	15,980.7	13,658.7	9,459.8	8,958.5	11,587.2	15,710.6	14,159.9	16,493.1	180,175.3
West Las Animas, Colo	Oct. 1, 1881	5,959.5	5,960.0	7,149.0	8,394.7	8,441.3	6,217.0	5,549.0	5,905.7	6,400.7	6,214.7	4,453.3	5,147.0	73,348.5
Dodge City, Kans	Sept. 15, 1874	8,082.7	7,793.2	10,439.0	10,707.9	10,752.5	9,544.2	9,341.3	8,283.5	8,915.5	8,910.5	7,505.1	7,645.5	109,897.9
Elliott, Fort, Tex	Nov. 29, 1879	8,200.4	7,879.2	9,943.2	10,398.0	10,061.6	8,631.0	7,424.0	6,116.4	7,239.4	8,098.0	7,155.0	7,463.7	100,120.7
Southern Slope:														
Sill, Fort, Ind. T	June 23, 1875	7,469.7	7,785.0	9,304.5	9,887.2	9,743.2	8,751.2	7,459.9	6,233.0	7,295.8	7,816.0	6,853.6	7,300.0	95,965.0
Concho, Fort, Tex	Oct. 10, 1875	6,190.2	6,341.7	7,263.3	7,903.3	8,235.9	7,149.6	6,588.4	5,894.1	5,606.6	5,986.3	5,698.3	6,411.7	80,509.5
Davis, Fort, Tex	Dec. 24, 1877	4,144.0	3,920.3	4,997.7	5,122.4	4,279.9	3,857.4	3,589.1	3,413.3	3,154.8	3,809.3	3,925.2	4,608.2	48,218.0
Stockton, Fort, Tex	Feb. 26, 1876	6,331.7	5,592.6	7,178.0	7,719.1	9,101.3	8,901.1	8,086.6	7,071.6	7,661.5	6,722.9	5,105.1	5,129.4	81,390.4
Southern Plateau:														
Santa Fé, N. Mex	Nov. 20, 1871	5,158.6	4,782.5	6,000.8	6,308.6	6,330.2	5,385.8	4,961.1	4,557.3	4,281.1	4,922.4	4,693.2	4,670.0	60,700.4
El Paso, Tex	Nov. 5, 1877	3,526.7	3,906.5	4,822.8	4,687.0	4,332.3	3,742.8	3,436.4	2,535.6	2,607.6	3,007.8	3,164.7	3,482.1	43,640 2

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
South'n Plateau—Cont'd:														
Apache, Fort, Ariz...	Oct. 9, 1877	3,762.5	3,944.5	5,017.2	5,792.5	5,775.3	5,537.7	4,561.3	3,852.5	4,042.8	4,346.2	3,817.2	3,837.6	56,202.8
Grant, Fort, Ariz	Nov. 1, 1875	4,780.8	5,091.2	5,546.0	6,377.8	5,835.5	5,629.8	4,963.3	4,446.5	5,104.0	5,320.0	4,900.0	4,923.2	62,945.4
Prescott, Ariz........	Nov. 19, 1873	3,701.2	4,212.8	5,337.7	6,162.7	5,906.7	5,293.3	4,349.6	3,574.0	3,818.2	4,227.2	3,830.2	3,802.2	55,259.2
Yuma, Ariz..........	Nov. 18, 1873	4,216.0	4,734.0	4,370.6	4,476.4	4,274.7	3,615.6	4.423.5	4,087.5	2,963.0	3,315.1	3,597.0	3,678.4	47,641.8
Middle Plateau:														
Winnemucca, Nev ...	July 1, 1877	6,854.7	6,407.5	7,162.2	6,390.8	6,464.3	6,609.8	7,212.8	6,608.5	6,141.5	6,331.8	5,658.7	6,450.3	75,816.0
Salt Lake City, Utah	Mar. 19, 1874	2,956.5	2,955.7	4,368.7	4,505.0	4,821.4	4,440.3	4,250.2	4,210.5	3,945.2	3,670.2	2,806.2	2,891.8	46,365.7
Northern Plateau:														
Boisé City, Idaho	July 1, 1877	3,189.7	3,309.0	4,180.4	4,273.9	4,376.1	3,547.4	3,810.0	2,827.5	2,746.0	3,003.5	2,528.4	2,593.5	40,216.0
Lewiston, Idaho	July 1, 1879	2,532.4	2,117.5	2,498.8	2,356.0	2,412.8	2,094.0	2,366.6	2,080.6	1,596.4	1,530.8	1,090.4	2,155.6	24,022.0
Dayton, Wash	July 1, 1879	3,392.2	3,640.8	4,224.2	4,552.5	4,142.8	3,904.0	3,888.2	3,678.8	3,520.0	4,205.2	3,518.5	3,561.8	46,224.0
Spokane Falls, Wash	Feb. 5, 1881	2,766.3	3,088.8	3,465.8	4,407.2	4,093.8	4,008.8	3,967.8	3,328.2	2,917.5	3,180.8	2,491.0	2,731.5	38,956.0
North Pacific Coast:														
Canby, Fort, Wash...	Sept. 1, 1883	11,563.0	7,714.0	5,710.0	7,129.0	6,717.0	6,574.0	4,239.0	5,503.0	6,909.5	8,087.5	8,603.5	9,640.5	89,779.0
Olympia, Wash......	July 1, 1877	3,080.3	2,982.9	3,020.6	2,960.0	2,897.9	2,590.6	2,601.5	2,108.8	2,228.8	2,820.2	2,612.2	3,110.4	32,832.3
Tatoosh Island, Wash	Oct. 1, 1883	12,136.0	11,705.0	8,339.0	7,444.0	8,138.0	5,672.0	3,790.0	6,016.0	6,351.0	9,202.5	12,475.0	12,404.0	105,496.0
Portland, Oreg.......	Nov. 1, 1871	4,398.7	3,521.4	3,781.1	3,432.5	3,607.4	3,382.7	3,508.1	3,050.6	3,025.1	3,031.0	3,181.2	3,497.8	40,878.9
Roseburg, Oreg......	July 15, 1877	2,202.1	2,085.6	2,379.9	2,538.7	2,562.6	2,619.0	2,613.4	2,446.5	1,988.2	1,858.0	1,426.6	1,797.1	27,286.5
Middle Pacific Coast:														
Cape Mendocino, Cal.	July 27, 1882	11,618.5	12,129.0	10,606.0	15,183.0	12,607.0	12,665.0	16,385.0	14,645.0	11,857.0	11,763.0	11,825.5	11,542.7	....
Red Bluff, Cal.......	July 1, 1877	5,618.7	5,633.3	6,471.7	6,050.9	6,033.0	5,492.6	4,481.9	3,769.3	4,463.6	4,887.2	4,044.9	5,002.1	60,636.6
Sacramento, Cal	July 1, 1877	4,761.1	4,554.1	5,433.9	5,469.1	5,515.7	5,504.3	5,104.5	4,487.2	4,071.5	3,846.6	3,279.9	4,565.2	57,061.4
San Francisco, Cal...	Mar. 8, 1871	5,283.2	4,969.8	6,624.0	7,189.9	8,309.6	8,980.5	9,495.8	8,962.9	7,134.5	5,762.6	4,397.4	4,941.9	82,091.6
South Pacific Coast:														
Los Angeles, Cal.....	July 1, 1877	4,276.4	4,068.3	4,101.7	3,950.4	4,028.1	3,715.7	3,602.2	3,401.4	3,368.1	3,581.1	3,508.4	3,825.1	45,290.3
San Diego, Cal.......	Nov. 1, 1871	3,866.5	4,157.4	4,396.7	4,863.8	4,954.8	4,583.7	4,726.3	4,517.3	4,308.2	4,066.5	3,615.1	3,830.8	52,326.9
Alaska Stations:														
Saint Michael's, Fort, Alaska	June 28, 1874	10,310.2	8,732.2	9,576.4	8,558.0	7,431.0	7,505.4	8,381.3	9,094.8	8,965.9	10,530.0	9,982.2	8,903.3	106,230.8
Sitka, Alaska........	Mar. 30, 1881	7,648.7	6,482.3	7,080.7	6,265.2	6,475.8	4,064.5	5,426.5	4,634.0	5,476.8	6,659.0	8,080.0	9,150.2	79,085.7
Unalashka, Alaska...	Aug. 18, 1878	9,247.0	10,596.0	9,933.0	9,288.8	8,206.0	7,894.3	7,276.8	6,515.0	9,094.3	8,700.5	8,841.4	10,174.8	108,501.7
Behring's Island, Behring Sea.......	May 22, 1882	11,906.5	11,379.5	10,827.5	9,884.0	8,970.5	7,891.0	7,200.0	6,969.3	7,392.3	11,502.7	9,921.0	9,866.7	111,170.8

APPENDIX 47.

Average hourly velocity of the wind, in miles, at stations of the Signal Service, United States Army, for each month and the year. (*Computed from the commencement of observations at each, to and including December*, 1884.)

[The average hourly velocity is obtained by dividing the average monthly movement by twenty-four times the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:													
Eastport, Me	12.4	12.5	12.8	10.1	8.8	6.7	6.3	5.7	7.4	9.6	11.8	11.8	9.6
Portland, Me	7.7	8.4	9.1	8.8	7.8	6.9	6.6	5.8	6.7	7.4	8.3	7.9	7.6
Boston, Mass	9.9	10.6	11.8	10.1	8.8	7.8	7.4	7.1	8.2	9.0	10.3	10.0	9.2
Block Island, R. I	17.6	16.5	17.3	14.6	14.0	12.2	11.6	10.3	13.7	15.1	16.6	17.5	14.8
New Haven, Conn	8.0	8.3	9.4	9.0	7.4	6.4	6.1	5.8	6.8	7.4	8.1	7.9	7.6
New London, Conn	7.7	8.6	9.1	8.4	7.1	6.1	5.7	5.3	6.1	7.1	8.0	7.6	7.2
Middle Atlantic States:													
Albany, N. Y	7.8	8.3	8.8	8.4	7.0	5.9	5.2	4.5	5.0	6.1	7.2	7.8	6.8
New York City	9.9	10.9	11.6	10.0	8.8	8.0	7.7	7.5	8.7	9.4	10.1	10.2	9.4
Philadelphia, Pa	10.2	10.8	11.8	11.1	9.7	9.0	8.4	7.6	8.3	9.8	9.7	10.1	9.7
Atlantic City, N. J	9.8	10.7	11.7	11.4	9.9	8.8	7.6	8.9	10.1	9.5	9.6	9.6	9.8
Barnegat City, N. J	14.9	14.0	15.2	13.7	12.0	10.9	9.9	10.7	12.4	12.7	13.6	13.3	12.8
Cape May, N. J	14.6	16.3	16.5	14.8	12.6	11.0	10.2	9.8	11.8	13.7	15.8	16.0	13.6
Sandy Hook, N. J	15.1	14.7	16.6	14.5	12.4	11.9	11.1	11.2	13.7	14.9	16.4	16.9	14.1
Delaware Breakwater, Del	16.8	18.1	19.3	16.9	15.5	13.8	12.1	12.2	15.2	16.0	17.0	17.1	15.8
Baltimore, Md	5.6	6.1	7.0	6.9	6.0	5.9	5.6	4.9	5.2	5.3	5.5	5.7	5.8
Washington City	6.3	7.1	8.5	8.0	6.5	5.9	5.4	4.8	5.3	5.4	6.1	6.5	6.3
Cape Henry, Va	12.9	13.5	14.6	13.7	11.7	11.1	9.8	9.8	12.5	13.0	13.6	13.5	12.5
Chincoteague, Va	12.3	13.1	14.4	13.9	12.4	10.7	9.6	9.8	11.1	12.4	12.9	11.7	12.0
Lynchburg, Va	3.7	4.4	5.1	4.7	3.9	3.2	3.1	2.8	2.6	2.9	3.2	3.7	3.6
Norfolk, Va	7.5	8.6	9.3	8.7	7.8	7.3	6.7	6.4	6.6	7.2	7.6	7.6	7.6
South Atlantic States:													
Charlotte, N. C	5.2	6.4	6.6	6.2	5.2	5.2	4.6	4.5	4.8	4.9	5.0	5.1	5.3
Hatteras, N. C	14.9	16.3	16.9	16.7	14.7	14.6	13.7	13.2	13.3	13.6	12.9	13.9	14.6
Kitty Hawk, N. C	15.3	16.0	15.9	16.0	14.5	13.5	12.2	12.4	14.8	15.1	16.1	15.5	14.8
Macon, Fort, N. C	12.7	13.7	14.4	13.4	12.5	12.4	11.3	11.6	12.9	13.4	12.6	12.8	12.8
Smithville, N. C	8.6	9.8	10.9	10.7	9.9	10.8	10.6	9.1	9.2	8.5	8.4	8.7	9.6
Wilmington, N. C	7.2	7.8	9.1	8.7	7.2	7.0	6.6	5.7	5.9	6.1	6.7	7.3	7.1
Charleston, S. C	7.4	8.1	8.8	8.6	8.7	8.2	7.6	7.2	7.8	7.7	7.4	7.1	7.9
Augusta, Ga	3.5	4.3	4.9	4.4	4.0	3.9	3.3	3.1	3.4	3.6	3.6	3.3	3.8
Savannah, Ga	6.3	7.1	7.9	7.9	7.4	6.3	5.8	5.4	5.7	6.1	6.3	6.2	6.5
Jacksonville, Fla	5.7	6.8	7.9	7.6	6.7	6.9	6.4	6.1	6.4	6.9	6.4	6.0	6.6
Florida Peninsula:													
Cedar Keys, Fla	9.0	9.5	11.1	10.4	9.7	9.3	8.4	8.6	8.3	9.3	7.9	8.4	9.2
Key West, Fla	10.9	10.3	11.2	10.5	9.4	7.7	7.5	7.3	8.2	11.8	11.2	11.1	9.8
Sanford, Fla	7.8	6.7	7.3	6.9	5.9	5.6	4.7	4.9	6.4	6.8	8.5	5.0	6.4
Eastern Gulf States:													
Atlanta, Ga	10.5	11.3	11.2	9.2	8.0	7.6	7.4	7.1	7.7	8.7	9.3	9.9	9.0
Pensacola, Fla	7.2	8.3	8.6	8.9	8.4	8.1	6.8	6.8	6.7	7.6	7.4	7.4	7.7
Mobile, Ala	6.1	6.6	6.9	6.9	6.3	5.7	5.4	5.1	5.7	6.0	6.0	5.9	6.0
Montgomery, Ala	5.5	6.2	6.5	5.9	4.9	4.7	4.2	3.9	4.5	4.8	5.1	5.0	5.1
Vicksburg, Miss	6.0	6.5	6.9	6.7	5.2	4.5	4.1	3.8	3.9	4.8	6.1	6.3	5.4
New Orleans, La	7.9	8.6	8.5	8.3	6.9	6.0	5.8	5.5	7.1	7.3	7.9	8.1	7.3
Western Gulf States:													
Shreveport, La	5.1	5.9	6.3	6.4	5.2	4.5	4.2	3.7	4.1	4.2	4.9	5.0	5.0
Fort Smith, Ark	6.0	6.3	6.6	6.4	5.5	3.9	3.8	3.6	4.0	4.4	4.6	5.8	5.1
Little Rock, Ark	5.5	6.2	6.8	6.5	5.2	4.3	4.4	3.8	3.8	4.8	5.3	5.6	5.2
Galveston, Tex	10.5	10.7	10.2	11.0	9.8	8.4	7.8	7.1	9.0	9.5	10.9	10.5	9.6
Indianola, Tex	14.0	14.7	14.3	16.4	13.1	11.4	10.8	9.5	11.1	11.7	14.1	14.0	12.9
Palestine, Tex	8.5	11.2	10.5	10.3	9.1	6.8	8.1	6.8	7.7	8.5	8.8	9.6	8.8
San Antonio, Tex	4.8	5.6	4.9	4.9	4.8	4.8	4.6	3.8	4.2	4.2	4.9	4.8	4.7
Rio Grande Valley:													
Brownsville, Tex	7.3	8.7	8.5	9.2	7.8	7.1	7.2	5.2	4.6	5.2	6.8	7.2	7.1
Rio Grande City, Tex	7.1	8.0	7.7	9.3	9.6	9.6	10.6	7.3	6.8	6.1	6.3	5.8	7.8
Ohio Valley and Tennessee:													
Chattanooga, Tenn	6.1	7.6	7.8	7.2	5.5	5.0	4.7	4.4	4.4	4.7	5.4	6.3	5.8
Knoxville, Tenn	6.0	6.8	7.6	7.1	5.8	5.3	4.7	4.2	4.4	4.4	5.3	5.8	5.6
Memphis, Tenn	6.1	5.9	6.7	6.7	4.9	4.8	4.4	4.0	4.5	4.9	5.8	5.9	5.4
Nashville, Tenn	4.6	5.1	5.5	5.3	4.4	4.0	3.5	3.3	3.5	3.9	4.6	4.7	4.4
Louisville, Ky	7.8	8.6	9.0	8.3	7.0	6.7	5.7	5.4	6.0	6.5	7.4	7.6	7.0

Average hourly velocity of the wind, in miles, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Ohio Valley and Tennessee—Continued:													
Indianapolis, Ind	6.4	6.5	7.4	7.0	5.7	5.1	4.3	4.5	4.7	5.1	5.8	6.3	5.7
Cincinnati, Ohio	6.3	6.8	7.4	6.7	5.8	5.5	4.8	4.3	4.8	5.2	6.0	6.2	5.8
Columbus, Ohio	8.1	9.2	9.4	8.6	7.1	6.7	5.8	5.0	5.9	6.3	7.8	8.2	7.3
Pittsburg, Pa	6.8	6.8	7.5	6.6	5.5	5.5	5.1	4.4	4.9	5.4	6.7	6.9	6.0
Lower Lakes:													
Buffalo, N. Y	11.5	10.8	10.4	8.7	7.9	7.2	7.3	6.6	8.1	9.2	11.0	12.1	9.2
Oswego, N. Y	10.7	10.9	10.3	8.8	7.6	6.4	6.3	6.0	7.4	8.7	10.6	10.9	8.7
Rochester, N. Y	11.5	11.6	11.7	10.5	9.8	8.3	7.7	7.0	8.3	9.1	10.5	10.8	9.7
Erie, Pa	11.7	11.7	11.2	10.7	8.9	8.3	7.4	7.1	8.8	10.3	12.5	12.9	10.1
Cleveland, Ohio	10.8	10.3	10.7	9.2	8.4	7.8	7.3	6.9	8.7	9.8	11.3	11.1	9.4
Sandusky, Ohio	13.0	13.9	14.7	14.2	12.7	11.9	10.3	10.2	11.7	13.0	14.5	13.4	12.8
Toledo, Ohio	9.4	9.1	9.7	9.5	8.5	7.7	6.8	6.6	7.4	8.4	9.2	9.3	8.5
Detroit, Mich	8.4	8.7	9.0	8.6	8.0	6.9	6.5	6.2	6.9	7.9	8.5	8.6	7.8
Upper Lakes:													
Alpena, Mich	9.3	10.1	10.2	9.3	8.4	7.9	7.5	7.1	8.4	9.1	9.6	9.4	8.9
Escanaba, Mich	9.4	9.8	10.4	10.1	9.0	8.5	8.0	7.7	9.7	10.5	9.8	9.7	9.4
Grand Haven, Mich	11.7	12.2	12.0	11.7	10.6	9.0	8.4	8.2	10.0	11.8	12.3	12.1	10.8
Mackinaw City, Mich	11.4	10.3	9.1	9.5	9.4	7.7	8.8	8.3	9.4	11.0	11.9	11.9	9.8
Marquette, Mich	9.4	8.9	9.2	8.3	7.3	6.9	6.8	7.0	8.6	9.3	9.5	9.7	8.4
Port Huron, Mich	10.3	10.7	10.7	10.7	10.0	8.3	7.8	7.3	8.4	9.5	10.4	10.5	9.6
Chicago, Ill	9.0	9.0	9.7	9.5	8.6	7.6	7.0	6.9	7.8	8.9	8.5	8.6	8.4
Milwaukee, Wis	10.5	12.3	12.9	11.9	10.6	9.3	8.5	8.9	10.0	11.3	11.9	12.3	10.9
Duluth, Minn	6.6	7.7	7.9	8.8	7.0	6.2	6.7	6.6	7.6	8.0	7.4	7.1	7.3
Upper Mississippi Valley:													
Saint Paul, Minn	7.7	8.1	8.8	9.7	9.4	8.4	7.2	7.4	8.2	8.8	8.0	7.5	8.3
La Crosse, Wis	6.9	7.8	8.4	8.7	7.8	7.1	6.3	6.2	7.0	7.8	7.6	6.9	7.4
Davenport, Iowa	8.5	9.0	10.3	10.5	9.1	7.6	6.6	6.4	7.7	8.1	8.6	8.3	8.4
Des Moines, Iowa	6.5	7.4	8.0	8.3	6.6	5.9	5.0	4.7	5.6	5.9	6.5	6.3	6.4
Dubuque, Iowa	4.9	5.6	6.5	7.0	5.9	5.3	4.4	4.2	4.7	5.3	5.2	4.8	5.3
Keokuk, Iowa	8.1	8.4	9.5	10.1	8.7	7.3	6.2	6.3	7.5	7.8	8.3	7.6	8.0
Cairo, Ill	7.8	8.6	10.0	9.0	7.5	6.5	5.3	4.9	5.8	6.6	7.8	7.8	7.3
Springfield, Ill	9.6	10.4	10.8	10.3	8.5	7.3	6.1	6.6	8.0	8.1	9.4	9.3	8.7
Saint Louis, Mo	10.5	10.5	11.8	10.9	9.8	8.9	7.8	7.5	8.7	9.5	10.7	10.4	9.8
Missouri Valley:													
Leavenworth, Kans	7.2	7.7	9.3	9.2	7.6	6.9	5.4	5.3	6.5	6.6	7.2	6.8	7.1
Omaha, Nebr	9.2	9.5	10.6	10.9	9.3	8.0	7.0	6.9	7.8	8.7	9.6	8.9	8.9
Bennett, Fort, Dak	6.4	6.3	8.0	9.6	9.7	8.4	7.8	8.9	8.7	7.9	7.0	6.2	7.9
Huron, Dak	10.9	10.7	11.3	12.4	11.3	9.3	9.5	9.4	10.7	10.2	10.0	9.4	10.4
Yankton, Dak	8.7	9.5	10.6	12.0	10.6	9.4	7.1	7.1	8.1	9.2	8.9	8.1	9.1
Extreme Northwest:													
Moorhead, Minn	11.2	11.0	11.8	11.1	11.7	10.3	9.3	10.0	10.8	10.9	11.0	10.8	10.8
Saint Vincent, Minn	9.7	9.6	9.7	8.8	9.6	8.8	7.8	7.4	8.5	9.3	10.1	9.7	9.0
Bismarck, Dak	8.0	8.5	9.4	11.3	10.4	9.2	9.0	8.6	9.0	9.6	8.7	7.9	9.1
Buford, Fort, Dak	6.9	7.2	8.1	10.3	9.6	8.7	8.9	9.0	8.8	9.0	8.2	7.0	8.5
Northern Slope:													
Assinaboine, Fort, Mont	11.0	11.8	9.7	10.4	9.7	9.8	10.3	8.7	9.0	10.5	11.9	11.0	10.3
Benton, Fort, Mont	7.8	7.9	7.5	7.9	7.2	7.0	6.8	5.8	6.8	7.3	8.2	7.5	7.3
Custer, Fort, Mont	6.7	7.2	7.8	8.6	8.0	6.9	7.0	6.9	6.6	6.9	6.4	6.6	7.1
Helena, Mont	4.6	5.0	6.2	6.6	6.7	6.5	6.3	5.6	5.5	5.4	5.0	4.6	5.7
Maginnis, Fort, Mont	15.2	12.0	9.5	10.4	10.3	10.2	9.9	9.4	9.5	11.9	13.6	12.5	11.2
Shaw, Fort, Mont	11.3	12.4	10.3	9.4	9.1	8.3	7.6	6.6	7.9	9.9	11.0	11.2	9.6
Deadwood, Dak	4.0	3.6	3.8	4.0	4.2	4.5	4.2	4.8	4.1	4.3	3.5	3.7	4.0
Cheyenne, Wyo	12.9	12.4	12.5	11.8	10.5	9.2	8.9	8.1	8.9	10.0	11.0	11.2	10.6
North Platte, Nebr	9.8	9.9	12.2	13.4	13.7	12.6	11.8	11.2	11.5	11.3	9.9	8.9	11.4
Middle Slope:													
Denver, Colo	6.4	6.2	7.3	7.8	6.8	6.4	6.1	5.6	5.6	5.9	6.1	5.9	6.3
Pike's Peak, Colo	25.0	25.3	25.3	21.3	21.5	19.0	12.7	12.0	16.1	21.1	19.7	22.2	20.1
West Las Animas, Colo	8.0	8.8	9.6	11.7	11.3	8.0	7.5	7.9	8.9	8.4	6.2	6.9	8.6
Dodge City, Kans	10.9	11.5	14.0	14.9	14.5	13.3	12.6	11.1	12.4	12.0	10.4	10.3	12.3
Elliott, Fort, Tex	11.0	11.6	13.4	14.4	13.5	12.0	10.0	8.2	10.1	10.9	9.9	10.1	11.3
Southern Slope:													
Sill, Fort, Ind. T	10.0	11.5	12.5	13.7	13.1	12.2	10.0	8.4	10.1	10.5	9.5	9.8	10.9
Concho, Fort, Tex	8.3	9.4	9.8	11.1	11.1	9.9	8.9	7.3	7.8	8.0	7.9	8.7	9.0
Davis, Fort, Tex	5.6	5.8	6.7	7.1	5.8	5.4	4.8	4.6	4.4	5.1	5.5	6.3	5.6
Stockton, Fort, Tex	8.5	8.2	9.6	10.7	12.2	12.4	10.9	9.5	10.6	9.0	7.1	6.9	9.6
Southern Plateau:													
Santa Fé, N. Mex	6.9	7.1	8.1	8.8	8.5	7.5	6.7	6.1	5.9	6.6	6.5	6.3	7.1
El Paso, Tex	4.7	5.9	6.5	6.4	5.8	5.2	4.6	3.4	3.6	4.0	4.4	4.7	4.9
Apache, Fort, Ariz	5.1	5.8	6.7	8.0	7.8	7.7	6.1	5.2	5.6	5.5	5.3	5.2	6.2
Grant, Fort, Ariz	6.4	7.5	7.5	8.9	7.8	7.8	6.7	6.0	7.1	7.2	6.8	6.6	7.2
Prescott, Ariz	5.0	6.2	7.2	8.6	7.9	7.4	5.8	4.8	5.8	5.7	4.6	5.1	6.1
Yuma, Ariz	5.7	7.0	5.9	6.2	5.7	5.0	5.9	5.5	4.1	4.5	5.0	4.9	5.4
Middle Plateau:													
Winnemucca, Nev	9.2	9.5	9.6	8.9	8.7	9.2	9.7	8.9	8.5	8.5	7.9	8.7	8.9
Salt Lake City, Utah	4.0	4.4	5.9	6.4	6.5	6.2	5.7	5.7	5.5	4.9	3.9	3.9	5.2

Average hourly velocity of the wind, in miles, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Northern Plateau:													
Boisé City, Idaho	4.3	4.9	5.6	5.9	5.9	4.9	4.4	3.8	3.8	4.0	3.5	3.5	4.5
Lewiston, Idaho	3.4	3.1	3.4	3.3	3.2	2.9	3.2	2.7	2.2	2.1	2.3	2.9	2.9
Dayton, Wash	4.6	5.4	5.7	6.3	5.6	5.4	5.2	4.9	4.9	5.7	4.9	4.8	5.3
Spokane Falls, Wash	3.7	4.5	4.7	6.1	5.5	5.6	5.3	4.5	4.1	4.3	3.5	3.7	4.6
North Pacific Coast:													
Canby, Fort, Wash	15.5	11.1	7.7	9.9	9.0	9.1	5.7	7.4	9.6	10.9	11.9	13.0	10.1
Olympia, Wash	4.1	4.4	4.1	4.1	3.9	3.6	3.5	2.8	3.1	3.8	3.6	4.2	3.8
Tatoosh Island, Wash	16.3	17.3	11.2	10.3	10.9	7.9	5.1	8.1	8.8	12.4	17.3	16.7	11.9
Portland, Oreg	5.9	5.2	5.1	4.8	4.8	4.7	4.7	4.1	4.2	4.1	4.4	4.7	4.7
Roseburg, Oreg	3.0	3.1	3.2	3.5	3.4	3.6	3.5	3.3	2.8	2.5	2.0	2.4	3.0
Middle Pacific Coast:													
Cape Mendocino, Cal	15.6	18.0	14.3	21.0	16.9	17.6	22.0	19.7	16.5	15.8	16.4	15.5	17.4
Red Bluff, Cal	7.6	8.3	8.7	8.4	8.1	7.6	6.0	5.1	6.2	6.6	5.6	6.7	7.1
Sacramento, Cal	6.4	6.9	7.3	7.6	7.4	7.6	6.9	6.0	5.7	5.2	4.6	4.1	6.3
San Francisco, Cal	7.1	7.3	8.9	10.0	11.2	12.5	12.8	12.0	9.9	7.7	6.1	6.6	9.3
South Pacific Coast:													
Los Angeles, Cal	5.7	6.0	5.5	5.5	5.4	5.2	4.8	4.6	4.7	4.8	4.9	5.1	5.2
San Diego, Cal	5.2	6.1	6.5	6.8	6.7	6.4	6.4	6.1	6.0	5.5	5.0	5.1	6.0
Alaska Stations:													
Saint Michael's, Fort, Alaska	18.9	12.9	12.9	11.9	10.0	10.4	11.3	12.2	12.5	14.2	13.9	12.0	12.8
Sitka, Alaska	10.3	9.5	9.5	8.7	8.7	6.9	7.3	6.2	7.6	9.0	11.2	12.3	8.9
Unalashka, Alaska	12.4	15.6	13.4	12.9	11.0	11.0	9.8	8.8	12.6	11.7	12.3	13.7	12.1
Behring's Island, Behring Sea	16.0	16.6	14.6	13.0	12.1	11.0	9.7	9.4	10.3	15.5	13.8	13.3	12.9

APPENDIX 48.

Average cloudiness, scale of 0 *to* 10, *at stations of the Signal Service, United States Army, for each month and the year.* (*Computed from the commencement of observations at each, to and including December,* 1884, *from the three telegraphic observations.*)

[The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:													
Eastport, Me	5.6	5.4	6.2	6.0	6.0	5.9	5.7	5.1	5.8	5.6	6.3	6.0	5.7
Portland, Me	4.9	4.7	5.6	5.5	5.4	4.9	4.8	4.4	4.7	5.1	5.1	5.3	5.0
Mount Washington, N. H	6.4	6.2	6.6	6.3	5.8	6.0	6.0	5.7	5.8	6.0	6.3	6.0	6.0
Boston, Mass	5.4	4.9	5.5	5.6	5.2	4.9	5.1	4.6	4.6	4.9	5.1	5.5	5.1
Block Island, R. I	5.4	4.7	5.0	4.6	4.6	3.6	4.1	4.3	4.6	4.8	4.9	5.6	4.7
New Haven, Conn	5.4	5.0	5.5	5.6	5.1	4.8	4.9	4.8	4.8	4.6	5.0	5.4	5.1
New London, Conn	5.1	4.7	5.2	5.2	4.6	4.5	4.7	4.5	4.7	4.6	4.9	5.1	4.8
Middle Atlantic States:													
Albany, N. Y	5.9	5.6	6.1	5.9	5.2	4.9	5.0	5.0	5.0	5.7	6.7	7.1	5.6
New York City	5.8	5.1	5.4	5.5	4.9	4.8	4.9	4.9	4.7	4.7	5.1	5.7	5.1
Philadelphia, Pa	5.6	5.3	5.5	5.4	4.5	4.7	4.8	4.7	4.5	4.5	4.9	5.9	5.0
Atlantic City, N. J	6.0	5.4	5.7	5.6	4.8	4.6	4.7	4.9	4.7	4.5	5.1	5.7	5.2
Barnegat City, N. J	5.8	5.5	5.7	5.6	4.9	4.8	4.9	4.7	4.8	4.7	5.0	5.6	5.2
Cape May, N. J	5.1	4.5	5.0	4.6	4.0	4.1	4.4	4.7	4.0	3.9	5.1	5.1	4.6
Sandy Hook, N. J	5.5	5.2	5.4	5.6	4.6	4.5	4.7	4.6	4.9	4.6	4.9	5.6	5.0
Delaware Breakwater, Del	6.4	5.4	5.6	5.8	4.4	5.0	4.8	4.7	4.3	4.7	4.9	5.6	5.1
Baltimore, Md	5.6	5.3	5.4	5.4	4.7	4.9	4.9	5.0	4.6	4.5	4.8	5.3	5.0
Washington City	6.0	5.6	5.5	5.4	4.8	5.0	4.6	4.9	4.7	4.7	5.1	5.7	5.2
Cape Henry, Va	5.9	5.1	5.1	5.2	4.4	4.5	4.9	5.2	4.5	4.3	5.0	5.5	5.0
Chincoteague, Va	6.4	5.0	4.8	5.3	4.2	4.7	4.9	4.9	3.9	4.6	4.5	5.3	4.8
Lynchburg, Va	5.2	4.9	4.8	4.9	4.3	4.8	4.6	5.0	4.1	3.9	4.4	4.8	4.6
Norfolk, Va	5.4	5.3	5.0	5.2	4.6	4.9	4.9	5.1	4.7	4.2	4.7	5.0	4.9
South Atlantic States:													
Charlotte, N. C	6.4	5.3	5.2	5.4	4.9	5.2	5.1	5.1	4.5	4.8	4.6	5.2	5.2
Hatteras, N. C	6.0	5.0	5.0	5.1	4.3	4.8	4.6	5.4	4.5	4.7	5.4	5.2	5.0
Kitty Hawk, N. C	5.8	4.8	4.8	5.0	4.2	4.3	4.6	5.3	4.6	4.5	4.8	5.1	4.8
Macon, Fort, N. C	6.2	5.0	5.0	5.5	4.5	5.5	4.8	5.6	4.6	4.4	4.7	5.2	5.1
Smithville, N. C	5.4	4.8	4.5	4.6	3.8	4.3	4.4	4.9	4.5	4.2	4.6	4.7	4.6
Wilmington, N. C	5.4	5.2	4.8	4.6	4.5	4.9	5.0	5.4	5.0	4.1	4.8	5.0	4.9
Charleston, S. C	4.9	4.6	4.2	4.2	4.1	4.7	4.6	5.0	4.7	3.6	4.2	4.6	4.5
Augusta, Ga	5.0	4.8	4.6	4.5	4.0	4.6	4.5	5.0	4.4	3.8	4.7	4.8	4.6
Savannah, Ga	5.1	4.8	4.3	4.5	4.3	4.9	4.7	5.2	4.8	4.1	4.7	4.6	4.7
Jacksonville, Fla	4.7	4.6	3.9	4.1	4.0	4.6	4.1	4.3	4.6	4.8	4.7	4.6	4.3
Florida Peninsula:													
Cedar Keys, Fla	4.4	3.7	3.5	3.4	3.5	4.6	4.2	4.5	3.1	2.9	3.8	4.0	3.8
Key West, Fla	4.2	3.5	2.8	3.0	4.2	4.8	4.8	5.0	5.2	4.6	4.0	4.0	4.2
Sanford, Fla	4.5	3.7	4.0	3.8	4.0	6.0	4.0	4.3	5.2	4.7	4.9	3.7	4.2
Eastern Gulf States:													
Atlanta, Ga	6.3	5.4	4.9	4.9	4.5	5.2	4.8	5.4	4.1	4.6	4.8	5.4	5.1
Pensacola, Fla	5.7	5.0	4.4	4.9	4.2	4.7	4.7	4.7	3.6	4.1	4.8	5.3	4.7
Mobile, Ala	5.4	5.0	4.7	4.8	4.2	4.8	4.9	4.8	4.4	4.0	4.5	5.1	4.7
Montgomery, Ala	6.2	5.5	4.8	4.9	4.4	5.1	4.8	4.8	4.4	4.3	4.8	5.6	4.9
Vicksburg, Miss	5.8	5.5	4.9	4.5	4.3	4.0	4.2	4.0	4.4	3.8	4.8	5.4	4.6
New Orleans, La	5.3	5.0	4.9	5.0	4.6	4.6	5.0	4.7	4.5	4.1	4.8	5.5	4.9
Western Gulf States:													
Shreveport, La	5.9	5.6	5.2	5.0	4.8	4.5	4.2	3.6	3.7	3.9	4.7	5.5	4.7
Fort Smith, Ark	5.1	6.4	5.2	5.3	4.3	3.9	4.2	4.0	3.5	4.6	4.5	5.1	4.7
Little Rock, Ark	5.7	5.9	5.2	4.5	4.6	3.5	4.0	3.4	3.4	3.9	4.7	5.2	4.5
Galveston, Tex	5.5	5.4	5.2	4.9	4.8	4.1	3.9	4.1	4.0	3.8	4.7	5.4	4.6
Indianola, Tex	5.4	5.7	5.6	5.0	5.0	4.0	3.7	3.8	3.9	3.7	4.8	5.6	4.6
Palestine, Tex	5.7	5.9	5.4	5.5	4.9	4.2	4.1	3.5	3.7	4.4	4.8	5.3	4.8
Rio Grande Valley:													
Brownsville, Tex	5.8	5.6	5.5	5.3	4.6	3.9	3.8	4.6	4.7	4.2	5.5	5.8	4.9
Rio Grande City, Tex	5.4	4.5	4.8	4.1	4.0	3.5	3.0	4.3	3.8	4.2	4.5	4.8	4.1
Ohio Valley and Tennessee:													
Chattanooga, Tenn	6.3	5.9	5.3	5.1	4.3	4.4	4.2	4.8	4.2	4.7	4.8	5.9	5.0
Knoxville, Tenn	6.4	5.7	5.3	5.0	4.4	5.0	4.6	4.5	4.0	3.9	5.2	5.4	5.0

Average cloudiness, scale of 0 *to* 10, *at stations of the Signal Service, United States Army, &c.*—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Ohio Valley and Tennessee—Continued:													
Memphis, Tenn	5.9	5.9	5.1	5.0	4.7	4.3	4.4	4.0	3.9	4.0	5.3	5.8	4.8
Nashville, Tenn	6.5	6.1	5.7	5.5	5.0	5.2	4.9	4.3	4.4	4.2	5.4	6.3	5.4
Louisville, Ky	6.2	6.0	5.9	5.4	4.7	5.4	4.7	3.9	4.3	4.1	5.6	6.3	5.2
Indianapolis, Ind	6.3	5.9	6.2	5.5	4.9	5.3	4.6	4.0	3.9	4.5	5.7	6.4	5.3
Cincinnati, Ohio	6.4	6.1	5.9	5.3	4.4	5.1	4.5	4.2	4.2	4.4	5.7	6.5	5.3
Columbus, Ohio	7.0	6.5	6.5	5.4	4.5	5.3	4.4	4.2	4.3	4.8	5.6	7.2	5.5
Pittsburg, Pa	7.1	6.6	6.5	5.6	4.9	4.9	4.9	4.4	5.0	5.4	6.5	7.1	5.8
Lower Lakes:													
Buffalo, N. Y	7.7	6.5	6.3	5.6	5.2	4.9	4.7	4.4	5.1	6.0	7.4	8.2	6.0
Oswego, N. Y	8.0	7.3	6.8	5.8	5.1	4.9	4.8	4.6	5.3	6.4	8.1	8.7	6.3
Rochester, N. Y	7.9	6.9	6.7	5.6	4.8	4.7	4.6	4.3	5.0	6.0	7.7	8.4	6.0
Erie, Pa	7.7	6.6	6.5	5.6	4.6	4.6	4.4	4.2	5.0	6.0	7.7	8.3	5.9
Cleveland, Ohio	7.4	6.5	6.6	5.4	4.7	4.6	4.5	4.0	4.9	5.0	7.3	7.6	5.8
Sandusky, Ohio	7.0	6.4	6.3	5.4	4.6	4.7	4.2	4.1	4.4	5.2	6.5	7.6	5.5
Toledo, Ohio	7.0	6.4	6.4	5.6	5.0	5.1	4.7	4.3	4.6	5.5	6.5	7.3	5.7
Detroit, Mich	7.0	6.1	6.3	5.4	4.9	5.0	4.3	4.0	4.4	5.1	6.2	6.9	5.5
Upper Lakes:													
Alpena, Mich	7.1	6.2	5.8	4.8	4.9	4.6	4.3	4.1	5.2	6.0	7.2	7.8	5.7
Escanaba, Mich	6.3	5.8	5.5	5.1	5.3	4.9	4.5	4.8	5.3	6.4	7.1	6.9	5.7
Grand Haven, Mich	7.9	6.5	6.1	5.0	4.4	4.5	3.7	3.6	4.4	5.4	7.3	8.1	5.6
Mackinaw City, Mich	7.0	6.2	5.0	5.2	5.8	5.1	5.4	4.0	5.0	6.4	7.7	8.8	6.0
Marquette, Mich	6.7	6.1	5.4	5.1	4.8	4.8	4.4	4.3	5.8	6.6	7.1	7.3	5.7
Port Huron, Mich	7.1	6.4	6.5	5.6	5.2	4.9	4.6	4.6	4.9	6.1	6.8	7.9	5.9
Chicago, Ill	5.7	5.5	5.8	5.3	4.6	5.1	4.0	3.7	4.3	5.2	5.9	6.0	5.1
Milwaukee, Wis	6.0	5.8	6.0	5.6	5.1	5.2	4.5	4.5	4.9	5.5	6.3	6.3	5.5
Duluth, Minn	5.1	5.5	4.9	5.2	5.1	5.3	4.7	4.9	5.3	6.1	6.2	5.8	5.4
Upper Mississippi Valley:													
Saint Paul, Minn	4.9	4.9	5.2	5.2	5.2	5.0	4.2	4.6	4.8	5.1	5.8	5.1	5.0
La Crosse, Wis	4.8	4.8	5.3	4.6	5.0	4.9	4.2	4.3	4.5	5.2	5.8	5.4	4.9
Davenport, Iowa	5.5	5.5	5.7	5.4	5.1	5.2	4.4	4.3	4.4	5.0	5.8	6.1	5.2
Des Moines, Iowa	4.8	5.0	5.4	5.7	5.8	5.8	4.6	4.5	4.4	4.8	4.7	6.0	5.2
Dubuque, Iowa	4.7	5.4	5.9	5.2	5.5	5.7	4.6	4.4	5.0	5.5	6.0	6.2	5.4
Keokuk, Iowa	5.6	4.9	5.5	5.1	5.2	5.3	4.4	3.8	3.9	4.5	5.4	5.8	5.0
Cairo, Ill	6.1	5.7	5.4	5.3	4.9	5.0	4.4	3.8	4.1	4.3	5.6	6.3	5.1
Springfield, Ill	5.7	5.2	5.5	5.3	4.7	5.5	3.9	3.6	3.8	4.5	4.9	6.3	4.9
Saint Louis, Mo	5.4	5.4	5.4	5.2	5.0	5.1	4.4	3.7	3.7	4.0	5.8	6.0	4.9
Missouri Valley:													
Leavenworth, Kans	5.0	5.0	5.1	5.2	5.5	4.6	4.3	3.7	4.0	4.2	4.5	5.3	4.7
Omaha, Nebr	5.0	4.9	5.4	5.4	5.8	5.1	4.4	4.2	4.0	4.2	4.5	5.2	4.8
Bennett, Fort, Dak	4.7	4.8	5.4	5.8	5.5	4.6	4.8	4.0	4.1	4.9	4.5	5.1	4.9
Huron, Dak	4.4	4.7	5.9	5.6	5.2	4.3	4.5	4.0	4.2	5.3	4.4	4.7	4.7
Yankton, Dak	4.0	4.9	5.2	4.9	5.5	4.6	4.1	3.8	3.8	4.3	4.3	4.8	4.5
Extreme Northwest:													
Moorhead, Minn	4.4	5.0	5.4	4.8	5.1	4.9	4.7	4.2	4.7	5.6	5.7	5.0	5.0
Saint Vincent, Minn	4.4	4.6	4.6	4.5	4.4	4.5	4.6	4.0	4.5	5.8	5.6	4.2	4.6
Bismarck, Dak	4.8	5.0	5.6	5.6	5.6	4.7	4.1	3.4	3.8	4.8	5.0	5.2	4.8
Buford, Fort, Dak	5.2	4.6	5.1	4.8	4.7	4.8	4.1	3.4	3.9	5.4	5.3	4.9	4.8
Northern Slope:													
Assinaboine, Fort, Mont	5.4	4.8	4.8	4.3	4.3	3.9	3.4	3.2	3.8	4.9	5.0	4.9	4.2
Benton, Fort, Mont	6.0	5.5	4.9	5.0	4.7	4.4	3.3	2.7	4.1	5.6	5.4	5.5	4.8
Custer, Fort, Mont	5.3	5.6	4.8	5.2	5.2	4.4	3.8	3.0	3.5	4.9	4.6	5.8	4.7
Helena, Mont	6.4	5.3	4.3	4.4	4.9	4.3	3.2	2.9	3.3	4.7	4.6	5.1	4.5
Maginnis, Fort, Mont	6.8	5.6	5.8	5.4	5.8	4.8	3.6	3.0	4.0	4.8	4.7	5.3	5.0
Poplar River, Mont	4.0	4.2	4.3	3.8	3.1	2.7	3.3	2.5	3.2	4.2	3.9	4.3	4.6
Shaw, Fort, Mont	5.4	4.7	4.4	4.6	4.7	4.2	3.3	2.9	3.7	5.0	4.6	4.9	4.4
Deadwood, Dak	4.2	4.6	5.0	5.3	5.3	4.6	3.4	3.2	3.8	3.9	4.1	4.7	4.3
Cheyenne, Wyo	3.5	3.4	4.2	4.9	5.2	3.8	3.9	3.7	3.2	3.7	3.5	3.8	3.9
North Platte, Nebr	4.0	4.2	5.1	5.0	5.7	4.4	4.1	3.6	3.7	4.2	4.2	4.6	4.4
Middle Slope:													
Denver, Colo	3.2	3.4	4.1	4.8	5.0	3.7	4.1	4.1	3.1	3.4	3.2	3.4	3.8
Pike's Peak, Colo	3.7	4.2	4.5	4.7	4.6	3.8	4.8	4.7	3.6	3.6	3.4	3.7	4.1
West Las Animas, Colo	3.8	3.1	3.7	4.7	5.4	4.0	4.4	3.9	3.1	3.5	2.7	4.4	4.1
Dodge City, Kans	4.1	4.0	4.1	4.0	4.9	3.5	4.1	3.4	3.1	3.3	3.7	4.1	3.9
Elliott, Fort, Tex	3.1	3.1	3.5	3.3	4.4	3.3	3.8	3.4	3.2	3.7	3.1	3.4	3.4
Southern Slope:													
Sill, Fort, Ind. T	4.6	4.8	4.2	3.6	4.6	3.5	3.7	3.2	3.6	3.7	4.0	4.7	4.0
Concho, Fort, Tex	3.9	4.2	3.6	3.1	4.0	3.5	3.5	3.6	4.1	4.4	3.9	3.0	3.7
Davis, Fort, Tex	3.3	3.4	3.3	2.5	2.8	2.9	3.5	3.6	3.5	3.5	3.4	3.3	3.1
Stockton, Fort, Tex	2.9	3.5	3.1	2.9	3.3	3.0	3.2	3.1	2.9	2.9	3.0	3.8	3.1
Southern Plateau:													
Santa Fé, N. Mex	3.5	3.8	3.8	4.0	3.9	3.4	5.1	5.0	3.1	2.5	3.1	3.3	3.7
El Paso, Tex	3.2	3.3	2.8	2.5	2.5	3.0	3.8	3.5	3.0	3.1	3.3	3.3	3.1
Apache, Fort, Ariz	3.4	4.0	3.5	3.0	1.8	2.0	4.8	5.0	2.3	2.2	2.1	3.0	3.1
Grant, Fort, Ariz	3.5	3.9	3.5	2.3	2.0	2.2	5.1	4.5	2.0	1.8	2.1	3.1	3.1

Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Southern Plateau—Continued:													
Prescott, Ariz	2.9	2.8	3.1	2.7	1.8	1.4	3.1	3.3	1.7	1.7	1.6	2.7	2.4
Thomas, Camp, Ariz	3.4	4.0	3.5	2.3	1.8	2.1	4.0	4.2	2.3	2.3	2.3	2.9	3.0
Yuma, Ariz	2.3	2.2	2.1	1.6	1.0	0.8	1.5	2.1	1.0	1.4	1.7	1.9	1.6
Middle Plateau:													
Winnemucca, Nev	4.5	4.6	4.2	4.6	4.3	3.8	1.7	1.4	2.0	2.6	3.4	4.4	3.5
Salt Lake City, Utah	5.3	5.3	5.4	5.3	4.6	3.1	2.9	3.0	2.6	4.0	4.5	5.7	4.3
Northern Plateau:													
Boisé City, Idaho	5.7	6.1	5.3	5.2	5.0	4.1	2.5	2.0	3.1	4.5	4.5	6.1	4.6
Lewiston, Idaho	6.9	5.8	4.9	4.8	4.3	4.5	2.8	2.1	3.1	5.0	5.4	6.5	4.7
Dayton, Wash	6.4	5.6	4.9	5.2	4.5	4.5	2.9	2.1	3.6	5.2	5.3	7.0	4.7
Spokane Falls, Wash	5.9	6.0	4.9	5.0	4.6	5.0	3.8	2.2	3.7	6.0	6.1	4.2	4.7
North Pacific Coast:													
Canby, Fort, Wash	5.7	3.9	4.7	5.2	5.0	6.7	7.0	4.8	4.6	5.4	5.6	5.8	5.2
Olympia, Wash	7.8	7.2	6.6	6.7	6.2	5.9	4.6	4.5	5.2	6.8	7.4	7.8	6.4
Tatoosh Island, Wash	6.7	5.5	6.3	6.0	5.1	6.8	7.0	4.3	6.7	5.8	7.3	6.7	6.1
Portland, Oreg	7.1	7.2	7.1	6.6	6.5	5.8	3.9	3.8	4.3	5.8	6.7	7.2	6.0
Roseburg, Oreg	7.0	6.6	5.7	6.0	5.0	4.6	3.0	2.2	3.2	5.5	6.1	6.7	5.1
Middle Pacific Coast:													
Cape Mendocino, Cal	4.9	3.4	5.0	6.0	4.1	3.4	2.5	1.4	2.3	3.6	3.9	4.6	3.9
Red Bluff, Cal	4.4	4.5	4.0	4.1	3.5	1.7	1.1	0.6	1.1	2.1	2.9	4.3	2.8
Sacramento, Cal	4.2	4.3	3.7	3.6	2.7	1.5	0.5	0.4	0.8	1.0	2.5	2.8	2.5
San Francisco, Cal	4.7	4.7	4.6	4.1	3.7	4.0	4.7	4.2	3.4	3.2	3.6	4.5	4.1
South Pacific Coast:													
Los Angeles, Cal	3.1	4.0	4.5	4.7	4.2	4.5	3.0	2.6	2.4	2.6	2.3	3.2	3.4
San Diego, Cal	4.1	4.4	4.8	4.5	5.3	5.0	4.6	4.1	3.7	3.8	3.5	3.8	4.3
Alaska Stations:													
Saint Michael's, Fort, Alaska	6.3	4.4	5.7	6.7	7.2	7.2	7.7	8.2	8.2	7.8	6.3	5.3	6.7
Sitka, Alaska	7.2	5.7	6.1	6.0	7.2	7.6	8.3	6.6	6.8	6.7	7.6	6.7	6.9
Unalashka, Alaska	8.7	8.9	7.6	8.7	8.6	8.6	7.4	7.9	8.2	8.5	8.4	8.2	8.0

APPENDIX 49.

Average number of clear, fair, and cloudy days, at stations of the Signal Service, United
at each to and including December, 1884,

[Cloudiness is recorded on a scale of 0 to 10, each observation. Clear

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
New England:																		
Eastport, Me	7.2	11.8	12.0	6.7	11.2	10.5	6.2	10.4	14.4	6.9	8.7	14.4	6.2	11.1	13.7	5.9	11.3	12.8
Portland, Me	9.6	12.2	9.2	9.1	11.5	7.6	7.2	11.8	12.0	7.6	11.2	11.2	7.9	12.2	10.9	8.1	13.7	8.2
Mt. Washington, N. H	4.9	10.9	15.2	6.1	9.1	13.2	6.0	9.8	15.2	7.0	8.8	14.2	7.3	12.2	11.5	6.8	10.5	12.7
Boston, Mass	7.8	10.3	12.9	8.7	9.0	10.6	8.5	9.6	12.9	6.9	11.6	11.5	7.4	14.5	9.1	8.4	11.7	9.9
Block Island, R. I	8.8	13.2	9.0	9.0	13.2	6.0	11.5	12.0	7.5	11.0	11.8	7.2	11.0	14.0	6.0	13.3	[illegible]	4.7
New Haven, Conn	8.2	12.0	10.8	8.1	10.7	9.5	7.6	12.3	11.1	6.7	12.1	11.2	9.2	13.2	8.6	9.0	12.8	8.2
New London, Conn	8.8	13.3	8.9	10.4	10.6	7.3	8.9	12.6	9.5	7.9	13.1	9.0	10.6	13.1	7.3	10.4	13.2	6.4
Middle Atlantic States:																		
Albany, N. Y	5.8	12.6	12.6	7.4	10.4	10.4	6.0	13.0	12.0	7.8	11.3	10.9	9.3	13.3	8.4	8.7	12.9	8.4
New York City	7.4	12.1	11.5	7.7	10.9	9.7	7.3	13.6	10.1	7.7	12.3	10.0	9.4	13.3	8.3	8.1	14.8	7.1
Philadelphia, Pa	6.4	11.9	12.7	7.4	10.6	10.3	7.4	11.4	12.2	7.8	11.6	10.6	11.1	11.0	8.9	8.8	13.6	7.6
Atlantic City, N. J	7.6	10.9	12.5	8.5	10.5	9.2	8.9	12.0	10.1	8.9	10.6	10.5	9.8	13.6	7.6	10.7	12.7	6.6
Barnegat City, N. J	6.8	12.2	12.0	7.7	11.0	9.5	6.5	14.1	10.4	7.6	11.0	11.4	8.6	15.7	6.7	7.8	16.2	6.0
Cape May, N. J	10.7	9.4	10.9	10.4	8.0	9.8	10.1	9.6	11.3	10.3	8.6	11.1	14.3	9.4	7.3	13.1	9.0	7.9
Sandy Hook, N. J	7.9	11.9	11.2	8.7	11.4	8.2	7.3	14.6	9.1	7.4	12.0	10.6	9.9	14.1	7.0	9.1	13.8	7.1
Delaware Br'kwater, Del	4.5	12.8	13.7	7.8	11.0	9.6	6.8	14.2	10.0	8.8	12.6	8.6	12.4	12.6	6.0	8.2	14.6	7.2
Baltimore, Md	7.1	13.2	10.7	7.5	12.6	8.1	8.6	11.7	10.7	7.5	12.7	9.8	10.6	12.2	8.2	7.6	15.2	7.2
Washington City	5.9	11.9	13.2	6.6	11.9	9.7	7.4	12.5	11.1	8.1	12.1	9.8	10.8	11.9	8.3	7.9	15.4	6.7
Cape Henry, Va	7.2	11.2	12.6	8.5	11.4	8.4	8.6	12.6	9.8	10.0	10.2	9.8	12.0	12.2	6.8	10.5	13.1	6.4
Chincoteague, Va	5.0	13.8	12.2	6.5	15.5	6.2	9.8	13.5	7.7	8.2	13.6	8.2	10.8	12.6	7.6	8.0	17.2	4.8
Lynchburg, Va	8.8	11.6	10.6	9.2	11.2	8.0	11.5	10.9	8.6	9.9	11.5	8.6	12.5	11.6	6.9	9.6	11.9	8.5
Norfolk, Va	8.8	11.1	11.1	8.4	11.0	8.8	9.9	11.0	10.1	9.6	10.5	9.9	11.0	12.4	7.6	9.6	12.7	7.7
South Atlantic States:																		
Charlotte, N. C	5.8	10.5	14.7	8.7	8.3	11.3	8.7	13.5	8.8	8.3	12.3	9.4	9.8	13.2	8.0	7.8	13.8	8.4
Hatteras, N. C	5.8	13.7	11.5	7.8	12.5	8.0	9.5	10.5	11.0	7.8	14.0	8.2	9.8	14.7	6.5	7.0	18.5	4.5
Kitty Hawk, N. C	9.4	12.0	9.6	9.4	10.3	8.6	10.4	11.8	8.8	9.4	13.2	7.4	12.7	12.4	5.9	11.2	13.1	5.7
Macon, Fort, N. C	4.6	14.2	12.2	8.0	11.5	8.8	9.5	12.2	9.3	8.8	10.0	11.2	9.0	16.2	5.8	5.2	16.3	8.5
Smithville, N. C	7.3	12.3	11.4	9.2	9.5	9.6	10.9	10.5	9.6	9.6	11.7	8.7	12.2	13.2	5.6	10.6	13.1	6.3
Wilmington, N. C	8.8	10.8	11.4	8.7	8.3	11.3	11.4	9.7	9.9	11.4	10.6	8.0	11.1	12.6	7.3	9.5	12.6	7.9
Charleston, S. C	9.5	10.5	11.0	11.2	9.4	7.6	12.6	10.7	7.7	11.9	11.3	6.8	11.4	13.9	5.7	9.0	14.4	6.6
Augusta, Ga	10.6	9.5	10.9	8.1	11.7	8.4	12.0	10.2	8.8	10.8	11.5	7.7	12.4	13.0	5.6	8.1	15.0	6.9
Savannah, Ga	9.0	10.8	11.2	9.3	10.4	8.6	11.5	11.2	8.3	11.5	10.6	7.9	11.0	13.9	6.1	7.3	15.4	7.3
Jacksonville, Fla	9.1	12.8	9.1	9.8	10.5	8.0	12.7	12.8	5.5	12.2	11.7	6.1	10.8	14.7	5.5	8.3	14.5	7.2
Florida Peninsula:																		
Cedar Keys, Fla	9.8	14.0	7.2	14.8	8.4	5.2	13.2	13.8	4.0	15.8	10.2	4.0	14.6	12.4	4.0	7.2	18.8	4.0
Key West, Fla	12.1	13.9	5.0	12.1	12.4	3.9	16.1	12.3	2.6	14.5	12.9	2.6	9.5	17.1	4.4	6.2	18.7	5.1
Sanford, Fla	11.0	11.0	9.0	16.0	10.0	3.0	13.0	14.0	4.0	12.5	13.5	4.0	12.0	15.0	4.0	3.0	20.5	6.5
Eastern Gulf States:																		
Atlanta, Ga	5.8	11.7	13.5	8.8	8.8	10.7	11.5	10.3	9.2	9.8	12.2	8.0	11.5	12.5	7.0	7.1	14.2	8.7
Pensacola, Fla	5.8	14.4	10.8	9.8	10.2	8.4	12.0	10.8	8.2	10.2	12.0	7.8	12.2	12.0	6.8	10.2	14.0	5.8
Mobile, Ala	8.0	11.8	11.2	8.6	10.8	8.8	11.3	10.3	9.4	10.1	11.0	8.9	12.2	12.8	6.0	9.5	13.9	6.6
Montgomery, Ala	6.0	11.1	13.9	7.3	10.5	10.4	11.2	10.0	9.8	10.3	10.4	9.3	11.2	14.3	5.5	7.3	14.3	8.4
Vicksburg, Miss	6.8	10.5	13.7	7.7	9.8	10.8	10.3	10.5	10.2	10.5	11.9	7.6	12.2	11.9	6.9	10.0	15.2	4.8
New Orleans, La	7.8	12.3	10.9	8.5	10.6	9.2	9.9	10.7	10.4	10.5	10.3	9.2	10.1	14.3	6.6	7.9	16.2	5.9
Western Gulf States:																		
Shreveport, La	7.8	10.4	12.8	8.2	9.5	10.6	8.6	12.4	10.0	9.5	12.6	7.9	8.9	14.8	7.3	9.2	16.1	4.7
Fort Smith, Ark	10.8	10.4	9.8	5.5	8.5	14.5	9.0	13.0	9.0	10.0	8.5	11.5	10.0	14.0	7.0	12.3	14.0	3.7
Little Rock, Ark	7.6	10.6	12.8	8.4	6.8	13.2	11.0	9.2	10.8	11.4	11.8	6.8	11.0	12.8	7.2	13.6	14.0	2.4
Galveston, Tex	8.3	9.5	13.2	7.4	10.7	10.2	8.3	12.3	10.4	9.8	10.3	9.9	9.6	14.6	6.8	12.0	13.4	4.6
Indianola, Tex	8.4	12.4	10.2	6.3	11.2	10.7	7.0	14.2	9.8	8.9	12.4	8.7	8.1	15.1	7.8	9.8	16.8	3.4
Palestine, Tex	10.0	13.5	7.5	7.5	8.5	12.5	7.0	13.0	11.0	7.0	15.7	7.3	7.7	16.3	7.0	9.7	18.0	2.3
Rio Grande Valley:																		
Brownsville, Tex	8.1	9.4	13.5	7.6	8.5	12.1	7.5	10.5	13.0	6.8	13.2	10.0	9.2	15.0	6.8	12.9	13.8	3.3
Rio Grande City, Tex	9.8	10.2	11.0	11.0	9.0	8.2	11.3	11.4	8.3	14.0	10.0	6.0	9.4	15.9	5.7	14.7	11.0	4.3

APPENDIX 49.

States Army, for each month and the year. (Computed from the commencement of observations from the three telegraphic observations.)

days comprise from 0 to 8; fair, 9 to 22, and cloudy, 23 to 30, inclusive.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
5.2	14.4	11.4	8.6	11.5	10.9	8.2	10.9	10.9	7.7	11.2	12.1	5.4	11.1	13.5	5.8	11.7	13.5	81.8	138.1	145.4
8.5	14.5	8.0	11.2	12.5	7.3	10.4	11.1	8.5	8.8	11.6	10.6	9.1	10.8	10.1	8.6	13.1	9.3	102.9	148.4	113.6
6.2	11.4	13.4	7.9	12.5	10.6	7.3	10.4	12.3	6.8	9.5	14.7	5.7	8.1	16.2	6.4	9.0	15.6	79.2	122.3	163.8
7.2	13.9	9.9	11.1	11.3	8.6	10.4	10.1	9.5	9.8	11.4	9.8	8.8	10.2	11.0	7.3	11.2	12.5	103.0	134.0	128.3
13.2	13.3	4.5	10.5	16.3	4.2	11.2	12.4	6.4	10.6	12.0	8.4	10.0	12.0	8.0	7.4	14.2	9.4	122.5	161.0	81.8
8.5	14.8	7.7	10.4	12.9	7.7	10.7	10.5	8.8	10.7	12.2	8.1	10.3	11.2	8.5	8.8	12.0	10.2	108.2	146.6	110.5
9.1	15.0	6.9	10.3	12.8	7.9	11.2	10.5	8.3	10.9	12.6	7.5	10.5	10.8	8.7	9.2	12.9	8.9	119.2	150.2	95.9
9.3	14.3	7.4	12.1	12.4	6.5	9.4	12.0	8.6	7.9	12.6	10.5	4.6	11.2	14.2	3.9	11.4	15.7	92.1	147.3	125.9
7.6	15.7	7.7	9.8	12.4	8.8	9.6	11.7	8.7	10.3	12.7	8.0	9.0	11.1	9.9	5.9	13.0	12.1	99.8	153.6	111.9
9.4	13.7	7.9	10.6	10.1	10.3	11.2	10.6	8.2	11.2	11.8	8.0	9.1	10.9	10.0	6.0	12.9	12.0	106.5	140.0	118.8
10.7	13.5	6.8	11.1	10.4	9.5	11.7	10.1	8.2	12.8	10.2	8.0	10.4	9.9	9.7	9.4	11.3	10.3	120.3	135.9	109.1
8.7	15.6	6.7	9.6	14.1	7.3	10.0	12.7	7.3	10.8	12.2	8.0	10.3	10.1	9.6	7.9	12.6	10.5	102.5	157.4	105.4
12.3	11.6	7.1	12.6	9.0	9.4	13.3	8.4	8.3	14.7	8.2	8.1	10.2	8.4	11.4	9.3	9.5	12.2	140.4	109.2	115.7
8.5	15.3	7.2	10.5	12.5	8.0	10.1	11.8	8.1	10.8	12.5	7.7	9.7	11.2	9.1	6.9	13.6	10.5	105.3	155.9	104.0
10.0	14.6	6.4	9.8	14.2	7.0	12.4	11.2	6.4	12.4	10.8	7.8	10.6	9.8	9.6	6.0	15.6	9.4	105.5	159.8	100.0
9.1	14.4	7.5	10.0	12.2	8.8	11.1	11.2	7.7	11.5	11.8	7.7	10.2	10.7	9.1	8.1	13.3	9.6	109.1	151.1	105.1
9.0	14.3	7.7	9.2	13.4	8.4	11.3	10.4	8.3	11.4	11.4	8.2	8.8	11.8	9.4	7.7	12.6	10.7	104.1	149.5	111.7
9.0	15.0	7.0	8.8	14.0	8.2	11.4	10.4	8.2	13.3	10.2	7.5	10.3	9.4	10.3	7.7	12.1	11.2	117.2	141.6	106.5
8.2	16.8	6.0	9.6	13.2	8.2	12.6	12.0	5.4	10.8	12.4	7.8	12.0	10.0	8.0	8.3	13.4	9.3	111.4	166.5	87.4
10.1	14.4	6.5	10.1	12.2	8.7	12.5	11.1	6.4	15.2	9.4	6.4	11.5	11.5	7.0	10.1	11.8	9.1	131.6	139.4	94.3
8.7	14.4	7.9	9.1	13.4	8.5	11.3	10.2	8.5	13.9	9.9	7.2	11.4	9.6	9.0	9.6	12.0	9.4	121.3	137.6	106.4
7.5	16.5	7.0	9.0	13.2	8.8	10.8	11.3	7.9	11.5	10.0	9.5	12.7	7.6	9.7	9.1	11.9	10.0	108.5	143.3	113.5
8.5	15.2	7.3	7.8	12.0	11.2	9.5	12.5	8.0	10.0	14.0	7.0	8.2	14.0	7.8	6.2	14.8	10.0	97.8	166.5	101.0
9.2	15.8	6.0	8.0	15.2	7.8	11.7	10.9	7.4	12.0	11.4	7.6	10.7	10.9	8.4	8.5	13.4	9.1	125.5	147.8	92.0
9.8	12.2	9.0	7.0	14.2	9.8	10.8	12.0	7.2	10.3	14.2	6.5	10.5	12.3	7.2	7.0	15.8	8.2	100.4	161.3	103.6
9.6	14.6	6.8	8.4	13.4	9.2	11.3	9.9	8.8	12.5	10.2	8.3	10.0	11.5	8.5	10.0	11.6	9.4	121.5	141.6	102.2
9.4	14.3	7.3	8.6	13.1	9.3	9.8	10.8	9.4	13.8	9.7	7.5	11.4	9.3	9.3	10.5	11.4	9.1	124.4	133.2	107.7
10.0	15.0	6.0	8.7	14.9	7.4	10.6	10.7	8.7	14.2	10.1	6.7	11.7	10.4	7.9	11.4	10.8	8.8	132.5	142.3	90.5
10.3	14.6	6.1	8.2	15.5	7.3	10.6	12.5	6.9	14.8	9.8	6.4	10.7	9.9	9.4	10.1	11.0	9.9	126.8	144.6	93.9
9.1	16.0	5.9	7.2	15.5	8.3	9.0	11.7	9.3	12.3	11.6	7.1	10.3	11.1	8.6	10.6	10.7	9.7	118.2	149.1	98.0
9.9	16.2	4.9	9.3	16.6	5.1	9.5	12.3	8.2	11.6	11.4	8.0	9.7	11.1	9.2	10.6	11.8	8.6	124.0	156.1	85.2
11.4	15.0	4.6	11.6	15.0	4.4	16.2	12.2	1.6	19.4	8.2	3.4	13.6	10.6	5.8	14.3	10.8	5.9	162.0	149.2	54.2
6.2	19.6	5.2	4.8	20.6	5.6	3.5	20.2	6.3	8.1	16.0	6.9	10.4	14.0	5.6	10.8	15.7	4.5	114.8	192.9	57.1
9.0	19.5	2.5	5.5	23.5	2.0	7.0	16.5	6.5	11.0	14.5	5.5	9.5	13.0	7.5	13.0	14.5	3.5	131.0	191.0	44.0
10.0	14.7	6.3	7.2	15.3	8.5	12.8	11.2	6.0	12.6	9.7	8.7	11.0	10.1	8.9	8.1	12.3	10.6	114.8	145.3	105.2
10.2	14.8	6.0	10.4	14.8	5.8	14.4	11.0	4.6	14.2	10.0	6.8	10.7	11.2	8.1	8.7	11.5	10.8	128.2	146.4	90.8
8.7	14.8	7.5	8.8	15.1	7.1	12.8	10.1	7.1	13.9	9.9	7.2	11.5	10.3	8.2	9.9	11.4	9.7	127.8	141.8	95.7
8.4	16.0	6.6	8.7	15.9	6.4	11.5	11.4	7.1	13.3	9.2	8.5	11.4	9.8	8.8	8.7	10.2	12.1	118.0	143.2	104.1
10.3	15.0	5.7	11.2	15.5	4.3	12.8	10.3	6.9	14.6	9.9	6.5	9.9	11.0	9.1	8.6	10.0	12.4	124.0	141.4	99.9
7.9	17.1	6.0	8.2	18.2	4.6	10.8	12.8	6.4	12.9	11.7	6.4	10.0	10.1	9.9	7.4	11.9	11.7	111.9	156.1	97.3
11.2	15.4	4.4	13.1	15.1	2.8	14.5	9.4	6.1	14.6	10.6	5.8	10.8	10.1	9.1	9.7	9.3	12.0	126.1	146.1	93.1
11.7	14.3	5.0	13.7	12.3	5.0	15.7	9.7	4.6	10.7	13.0	7.3	10.6	11.8	7.6	9.3	11.3	10.4	128.4	140.4	96.7
12.2	13.5	5.3	16.0	11.5	3.5	15.3	9.2	5.5	13.6	11.4	6.0	12.7	8.2	9.1	10.7	8.9	11.4	146.6	126.5	92.3
11.4	16.2	3.4	12.5	13.9	4.6	12.6	11.8	5.6	14.4	10.8	5.8	10.6	10.8	8.6	8.5	10.8	11.7	124.6	146.1	94.6
13.2	15.8	2.0	12.4	15.7	2.9	12.2	12.9	4.9	14.6	11.8	4.6	10.0	11.9	8.1	8.5	11.0	11.5	124.2	157.2	83.9
11.7	17.0	2.3	13.3	15.0	2.7	13.7	12.3	4.0	10.3	15.3	4.4	11.0	11.0	8.0	8.3	13.0	9.7	129.8	157.3	78.4
13.8	14.1	3.1	4.7	15.7	4.6	11.9	12.7	5.4	12.3	13.4	5.3	8.5	11.7	9.8	7.3	12.7	11.0	119.5	150.2	95.6
15.1	10.9	5.0	12.8	12.3	5.9	14.6	11.9	3.5	13.1	11.4	6.5	11.0	9.3	9.7	9.7	10.4	10.9	150.1	136.1	73.1

Average number of clear, fair, and cloudy days at stations

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Ohio Valley and Tennessee:																		
Chattanooga, Tenn	6.2	9.0	15.8	6.8	10.0	11.5	10.2	9.1	11.7	9.3	12.0	8.7	12.0	13.0	6.0	10.7	14.8	4.5
Knoxville, Tenn	6.1	10.2	14.7	7.3	9.5	11.5	8.9	11.5	10.6	9.8	10.9	9.6	11.4	13.7	5.9	8.1	14.9	7.0
Memphis, Tenn	7.3	9.5	14.2	7.9	8.4	12.0	9.6	10.4	11.0	10.1	10.5	9.4	10.1	13.8	7.1	8.7	15.8	5.5
Nashville, Tenn	5.5	10.7	14.8	6.2	9.5	12.4	8.2	10.9	11.9	7.8	12.2	10.0	9.2	14.2	7.6	6.3	17.1	6.6
Louisville, Ky	6.3	9.5	15.2	6.5	10.4	11.4	7.2	11.4	12.4	8.5	10.7	10.8	11.2	11.9	7.9	6.6	13.8	9.6
Indianapolis, Ind	5.4	10.9	14.7	6.3	9.4	12.5	6.3	10.9	13.8	7.0	12.6	10.4	9.5	12.6	8.9	6.7	13.6	9.7
Cincinnati, Ohio	5.3	10.0	15.7	5.6	10.1	12.6	6.4	12.0	12.6	8.1	11.8	10.1	9.5	13.7	7.8	7.1	13.1	9.8
Columbus, Ohio	3.7	10.8	16.5	4.0	11.0	13.3	4.7	11.8	14.5	10.0	8.8	11.2	11.5	12.5	7.0	8.5	13.2	8.3
Pittsburg, Pa	4.2	11.4	15.4	4.8	11.8	11.7	4.5	13.5	13.0	7.0	13.2	9.8	10.3	13.0	7.7	7.2	16.2	6.6
Lower Lakes:																		
Buffalo, N. Y	1.4	9.0	20.6	4.4	10.6	13.3	5.0	12.5	13.5	6.4	11.8	11.8	9.4	12.0	9.6	8.0	14.0	8.0
Oswego, N. Y	1.1	7.3	22.6	3.2	8.4	16.7	4.1	10.5	16.4	6.5	10.6	12.9	9.2	12.2	9.6	8.5	12.8	8.7
Rochester, N. Y	1.4	8.4	21.2	3.1	11.1	14.1	3.9	11.4	15.7	7.3	10.3	12.4	8.8	12.9	9.3	8.1	12.4	9.5
Erie, Pa	2.2	9.7	19.1	4.2	10.8	13.3	4.5	12.1	14.4	6.7	13.4	9.9	10.6	12.6	7.8	9.5	13.4	7.1
Cleveland, Ohio	2.8	8.8	19.4	4.3	11.9	12.1	4.3	12.3	14.4	7.3	12.8	9.9	10.2	12.9	7.9	9.3	13.5	7.2
Sandusky, Ohio	4.9	10.4	15.7	5.0	10.3	13.0	5.1	12.9	13.0	7.3	12.0	10.7	11.0	12.5	7.5	9.3	13.2	7.5
Toledo, Ohio	3.6	11.1	16.3	4.4	11.5	12.4	5.6	10.1	15.3	6.6	12.5	10.9	9.4	12.5	9.1	7.6	13.9	8.5
Detroit, Mich	3.7	9.9	17.4	5.4	11.4	11.5	5.4	12.4	13.2	7.1	12.7	10.2	9.4	13.6	8.0	8.7	13.3	8.0
Upper Lakes:																		
Alpena, Mich	2.4	11.8	16.8	5.7	10.6	12.0	6.5	12.7	11.8	9.3	11.8	8.9	9.7	13.6	7.7	10.1	13.5	6.4
Escanaba, Mich	5.0	13.1	12.9	5.6	11.9	10.8	7.7	12.4	10.9	8.5	12.4	9.1	7.7	13.4	9.9	7.9	14.9	7.2
Grand Haven, Mich	1.8	8.3	20.9	4.6	10.5	13.2	4.9	12.9	13.2	8.8	12.0	9.2	11.6	12.0	7.4	9.5	13.9	6.6
Mackinaw City, Mich	3.0	14.5	13.5	6.5	9.5	12.5	10.0	12.0	9.0	9.5	11.0	9.5	6.5	13.0	11.5	10.5	11.5	8.0
Marquette, Mich	4.0	12.5	14.5	5.1	11.1	12.2	7.8	12.4	10.8	8.7	13.0	8.3	9.4	12.8	8.8	9.7	12.6	7.7
Port Huron, Mich	3.3	12.3	15.4	4.9	10.9	12.5	4.7	13.7	12.6	7.5	12.0	10.5	8.7	12.9	9.4	8.3	14.2	7.5
Chicago, Ill	7.4	12.9	10.7	7.9	11.3	9.0	6.8	12.9	11.3	8.2	11.7	10.1	10.9	11.8	8.3	7.6	14.3	8.1
Milwaukee, Wis	5.4	15.0	10.6	5.8	12.5	10.0	6.5	13.3	11.2	6.8	13.4	9.8	8.8	13.6	8.6	6.6	16.1	7.3
Duluth, Minn	10.5	11.5	9.0	8.1	10.3	9.8	11.0	11.0	9.0	9.7	10.7	9.6	8.5	12.2	10.3	7.1	13.3	9.6
Upper Mississippi Valley:																		
Saint Paul, Minn	8.1	13.2	9.7	8.2	10.7	9.2	8.2	12.1	10.7	8.2	11.6	10.2	9.1	13.9	8.0	7.9	15.4	6.7
La Crosse, Wis	9.0	12.8	9.2	8.0	11.9	8.3	8.3	12.6	10.1	9.8	11.3	8.9	9.7	12.0	9.3	8.6	13.9	7.5
Davenport, Iowa	8.5	11.4	11.1	7.6	10.9	9.8	7.5	12.8	10.7	8.1	12.2	9.7	9.1	12.6	9.3	7.1	14.7	8.2
Des Moines, Iowa	10.8	11.4	8.8	8.8	10.8	8.7	7.7	13.5	9.8	8.3	10.9	10.8	7.3	11.7	12.0	5.3	14.2	10.5
Dubuque, Iowa	6.7	12.4	11.9	7.2	10.5	10.5	5.7	13.2	12.1	7.1	12.1	10.8	7.5	12.0	11.5	5.5	13.1	11.4
Keokuk, Iowa	5.9	11.9	13.2	5.9	11.4	11.0	4.2	14.6	12.2	5.0	14.2	10.8	4.5	16.3	10.2	3.6	15.4	11.0
Cairo, Ill	6.4	12.0	12.6	7.5	10.3	10.5	8.8	11.5	10.7	8.4	11.9	9.6	8.9	14.2	7.9	9.2	14.8	6.0
Springfield, Ill	8.0	12.0	11.0	8.0	10.4	10.0	8.8	11.2	11.0	9.2	12.4	8.4	10.6	12.8	7.6	6.4	15.2	8.4
Saint Louis, Mo	8.9	11.2	10.9	8.4	10.6	9.3	7.9	11.6	11.5	9.0	11.8	9.2	10.0	11.9	9.1	8.0	14.1	7.9
Missouri Valley:																		
Leavenworth, Kans	9.3	11.5	10.2	8.8	11.0	8.5	8.5	13.5	7.0	8.7	10.4	10.9	7.1	13.6	10.3	9.0	15.1	5.9
Omaha, Nebr	9.6	12.1	9.3	9.1	10.8	8.4	8.9	12.6	9.5	8.6	10.2	11.2	7.1	11.2	12.7	8.2	13.4	8.4
Bennett, Fort, Dak	8.0	17.2	5.8	10.0	11.3	7.0	7.8	14.0	9.2	7.0	11.2	11.8	7.8	12.5	10.7	11.5	12.2	6.3
Huron, Dak	9.7	17.3	4.0	9.7	10.7	8.0	5.0	16.0	10.0	8.0	11.3	10.7	9.7	12.3	9.0	11.3	15.3	3.4
Yankton, Dak	10.8	14.3	5.9	9.3	10.8	8.1	8.8	12.9	9.3	10.0	11.6	8.4	8.1	12.3	10.7	9.8	14.2	6.0
Extreme Northwest:																		
Moorhead, Minn	10.5	15.3	5.2	7.5	12.2	8.5	6.2	15.5	9.3	9.0	12.8	8.2	9.2	12.5	9.3	8.5	14.5	7.0
Saint Vincent, Minn	10.7	15.5	4.8	8.0	13.2	7.0	10.0	14.5	6.5	11.0	12.8	6.2	11.2	14.5	5.3	9.5	15.8	4.7
Bismarck, Dak	10.2	14.1	6.7	7.8	11.7	8.8	6.8	13.1	11.1	7.7	12.2	10.1	6.7	13.8	10.5	6.7	16.0	7.3
Buford, Fort, Dak	7.7	15.9	7.4	9.3	12.4	6.5	8.7	14.0	8.3	10.2	12.2	7.6	9.1	14.1	7.8	8.5	14.7	6.8
Northern Slope:																		
Assinaboine, Ft., Mont	7.0	15.5	8.5	9.2	12.0	7.0	11.0	12.0	8.0	9.5	14.5	6.0	8.3	16.0	6.7	12.7	12.3	5.0
Benton, Fort, Mont	5.8	11.8	13.4	6.2	12.4	9.8	8.8	11.8	10.4	8.3	13.5	8.2	8.8	14.0	8.2	9.8	13.5	6.7
Custer, Fort, Mont	8.2	15.5	7.3	4.0	16.5	8.0	8.0	16.0	7.0	5.8	16.8	7.4	6.2	17.3	7.5	9.2	15.3	5.5
Helena, Mont	3.5	14.5	13.0	5.2	15.2	7.8	10.8	13.7	6.5	8.4	13.8	7.8	6.2	16.8	8.0	8.8	15.2	6.0
Maginnis, Fort, Mont	5.0	12.0	14.0	7.0	14.0	7.5	9.5	8.0	13.5	7.5	12.0	10.5	7.0	14.0	10.0	10.5	11.0	8.5
Shaw, Fort, Mont	7.0	15.5	8.5	8.2	13.2	6.8	12.5	11.5	7.0	9.6	13.0	7.4	7.6	17.6	5.8	9.4	15.4	5.2
Deadwood, Dak	11.0	13.6	6.4	8.6	14.0	5.7	9.4	13.4	8.2	7.7	12.0	10.3	7.3	13.9	9.8	8.7	16.2	5.1
Cheyenne, Wyo	13.6	13.5	3.9	12.7	11.8	3.8	11.7	13.6	5.7	8.9	14.1	7.0	7.3	14.5	9.2	11.6	13.4	5.0
North Platte, Nebr	11.7	13.9	5.4	10.4	12.6	5.3	8.6	14.3	8.1	8.6	15.3	6.1	6.3	14.9	9.8	8.9	17.4	3.7
Middle Slope:																		
Denver, Colo	16.0	11.4	3.6	13.2	11.6	3.4	13.3	11.4	6.3	9.9	12.9	7.2	8.9	14.3	7.8	13.0	13.4	3.6
Pike's Peak, Colo	14.2	11.7	5.1	9.9	13.2	5.2	11.1	12.5	7.4	7.5	14.8	7.7	7.5	16.7	6.8	10.7	16.1	3.2
West Las Animas, Colo	13.0	13.5	4.5	16.0	9.0	3.3	13.0	14.7	3.3	9.0	15.0	6.0	5.7	18.3	7.0	11.7	14.6	3.7
Dodge City, Kans	12.3	10.2	8.5	12.1	9.6	6.6	12.3	11.7	7.0	12.2	11.8	6.0	6.3	15.1	9.6	11.7	13.8	4.5
Elliott, Fort, Tex	17.2	7.2	6.6	15.2	6.6	6.4	13.5	12.5	5.0	17.2	7.4	5.4	10.8	13.4	6.8	15.4	10.6	4.0
Southern Slope:																		
Sill, Fort, Ind. T	10.3	12.7	8.0	9.3	10.1	8.8	11.6	12.8	6.6	13.4	11.8	4.8	10.7	13.8	6.5	14.3	13.0	2.7
Concho, Fort, Tex	14.0	8.4	8.6	13.0	7.0	8.3	14.6	8.9	7.5	14.9	10.6	4.5	10.2	13.0	7.8	15.5	10.9	3.6
Davis, Fort, Tex	17.7	9.8	3.5	14.7	9.5	4.0	16.8	9.7	4.5	20.1	7.3	2.6	15.3	12.7	3.0	16.4	11.9	1.7
Stockton, Fort, Tex	19.7	6.4	4.9	15.7	8.3	4.3	19.5	7.7	3.8	17.9	8.8	3.3	15.6	11.3	4.1	15.9	11.5	2.6
Southern Plateau:																		
Santa Fé, N. Mex	15.3	11.1	4.6	11.3	12.5	4.4	12.6	13.7	4.7	11.5	14.7	3.8	12.4	15.2	3.4	13.7	13.9	2.4
El Paso, Tex	17.0	10.8	3.2	16.8	7.9	3.5	20.5	7.8	2.7	21.2	7.8	1.0	23.2	6.7	1.1	20.5	9.0	0.5

of the Signal Service, United States Army, &c.—Continued.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
10.8	15.9	4.8	7.8	17.0	6.2	12.2	13.5	4.8	11.7	11.3	8.0	11.2	9.5	9.3	8.2	10.8	12.5	117.3	146.3	101.7
10.1	14.7	6.2	10.2	14.7	6.1	13.9	10.0	6.1	15.4	8.6	7.0	9.2	10.4	10.4	8.8	10.6	12.1	117.4	139.1	108.8
10.8	14.6	5.6	13.2	12.1	5.7	13.1	9.9	7.0	13.7	10.6	6.7	10.1	9.0	10.9	7.9	10.1	13.0	124.8	133.3	107.7
8.4	16.2	6.4	11.6	14.6	4.8	11.9	11.8	6.4	12.7	11.1	7.2	8.4	11.1	10.5	5.7	10.8	14.5	100.9	148.6	115.8
9.6	14.8	6.6	11.8	13.6	5.6	11.5	11.9	6.6	12.2	12.1	6.7	7.7	10.1	12.2	5.9	9.7	15.4	104.3	140.1	120.9
9.2	14.1	7.7	11.4	14.0	5.6	11.6	11.7	6.7	9.8	12.8	8.4	6.6	10.1	13.3	5.2	9.8	16.0	94.5	142.7	128.1
9.5	13.1	8.4	11.3	12.4	7.3	11.8	10.7	8.0	11.8	11.3	8.4	7.3	11.1	11.6	5.4	11.2	14.4	97.3	139.6	128.4
9.8	16.3	4.9	12.7	11.3	7.0	10.8	12.6	6.6	9.6	12.7	8.7	6.6	12.1	11.3	8.1	10.4	17.5	95.7	144.1	125.5
8.1	16.7	6.2	10.4	14.7	5.9	8.9	13.8	7.3	8.4	13.5	9.1	5.3	11.9	12.8	2.2	12.7	16.1	80.4	162.6	122.3
8.9	15.7	6.4	10.8	13.8	6.4	8.6	12.4	9.0	7.2	11.1	12.7	2.4	9.3	18.3	0.6	8.2	22.2	74.5	139.5	151.8
9.1	14.6	7.3	10.0	13.4	7.6	7.3	12.0	10.7	5.4	10.0	15.6	1.4	6.4	22.2	0.6	5.5	24.9	66.6	123.6	175.1
8.8	14.8	7.4	10.6	13.5	6.9	8.4	12.8	8.8	6.5	11.2	13.3	2.6	8.9	18.5	0.9	6.5	23.6	70.9	132.5	161.9
10.4	15.3	5.3	12.0	13.8	5.2	9.0	12.2	8.8	7.7	9.2	14.1	2.0	8.8	19.2	1.5	6.6	22.9	81.0	137.4	146.9
9.7	15.7	5.6	12.6	13.3	5.1	9.6	11.6	8.8	8.5	10.6	11.9	3.4	9.3	17.3	2.1	9.6	19.3	84.1	142.4	138.8
10.8	14.5	5.7	11.9	13.3	5.8	10.6	13.1	6.8	9.1	12.0	9.9	4.6	11.9	18.5	2.7	9.4	18.9	92.5	145.2	127.6
9.5	15.0	6.5	12.0	12.5	6.5	10.6	11.8	7.6	8.6	11.7	10.7	5.0	11.2	13.8	3.0	10.8	17.2	86.0	144.7	134.6
9.8	15.1	6.1	11.8	12.6	6.6	9.7	12.9	7.4	8.6	12.0	10.4	5.1	10.5	14.4	2.5	11.6	16.9	87.3	147.9	130.1
10.7	14.4	5.9	11.6	13.9	5.5	8.7	11.9	9.4	6.5	11.0	13.5	1.9	11.6	16.5	1.6	9.1	20.3	84.8	144.4	136.0
9.7	15.1	6.2	10.2	13.4	7.4	7.5	14.0	8.5	5.4	11.1	14.5	3.8	11.3	14.9	3.6	11.6	15.8	80.9	154.7	129.7
13.9	13.2	3.9	13.7	13.2	4.1	10.4	13.0	6.6	8.2	10.6	12.2	3.2	9.5	17.3	1.4	7.4	22.2	91.8	136.3	137.2
6.0	18.0	7.0	13.5	11.5	6.0	9.0	13.7	7.3	4.0	13.7	13.3	1.7	9.0	19.3	0.3	5.7	25.0	79.5	141.0	145.0
9.9	15.0	6.1	11.1	13.1	6.8	7.2	12.2	10.6	5.2	11.2	14.6	2.2	10.0	17.8	2.7	9.5	18.8	82.3	145.8	137.2
9.2	15.9	5.9	10.3	14.3	6.4	8.5	14.4	7.1	5.6	13.5	11.9	4.0	11.7	14.3	2.0	10.3	18.7	75.7	157.4	132.2
12.4	13.4	5.2	12.7	13.5	4.8	11.2	12.4	6.4	9.4	12.5	9.1	6.8	10.4	12.8	6.5	11.5	13.0	107.9	148.8	108.6
9.9	16.4	4.7	9.9	15.7	5.4	8.4	14.6	7.0	6.9	12.4	10.7	5.0	11.8	13.2	5.0	12.6	13.4	84.9	168.4	112.0
9.4	15.7	5.9	9.7	13.2	8.1	7.7	12.1	10.2	6.8	9.9	14.3	5.7	11.1	13.2	7.6	11.1	12.3	101.8	142.2	121.3
10.2	16.2	4.6	10.3	14.9	5.8	9.1	13.6	7.3	10.3	12.2	8.5	6.9	13.2	9.9	8.4	12.6	10.0	104.9	159.7	100.7
10.9	13.9	6.2	10.9	14.0	6.1	10.8	12.0	7.2	9.1	11.7	10.2	6.3	11.1	12.6	8.1	12.2	10.7	108.9	150.1	106.3
10.5	15.3	5.2	12.1	13.1	5.8	10.9	12.9	6.2	10.1	11.0	9.9	7.3	11.1	11.6	5.9	12.2	12.9	104.4	149.6	111.5
9.8	15.0	6.2	11.4	12.7	6.9	10.9	12.8	6.8	10.9	11.8	8.8	11.0	11.6	7.4	6.1	13.3	11.6	106.5	149.0	109.8
9.3	15.0	6.7	9.8	14.5	6.7	8.5	13.4	8.1	7.3	12.3	11.4	5.7	11.7	12.0	5.5	11.7	13.8	86.8	151.9	126.6
7.0	16.5	7.5	9.1	15.7	6.2	9.8	12.8	7.4	8.7	12.7	9.6	5.6	11.8	12.6	5.2	11.4	14.4	75.5	165.4	124.4
11.9	12.8	6.3	15.2	12.2	3.6	13.9	11.1	5.0	13.6	10.8	6.6	9.1	10.4	10.5	7.4	10.5	13.1	119.8	142.4	103.1
12.5	13.7	3.8	12.8	15.7	2.5	14.2	11.5	4.3	11.2	12.3	7.5	9.5	12.2	8.3	6.0	11.7	13.3	119.0	150.4	96.0
11.1	13.2	6.7	13.9	13.6	3.5	13.9	11.1	5.0	13.3	11.6	6.1	7.9	12.2	9.9	6.9	11.1	13.0	119.1	143.8	102.4
11.4	14.3	5.3	13.6	12.6	4.8	12.7	11.4	5.9	12.2	12.2	6.6	10.7	11.8	7.5	8.8	11.8	10.4	120.2	149.6	95.5
10.6	14.4	6.0	11.8	13.1	6.1	13.2	10.2	6.6	13.0	10.5	7.5	11.0	10.8	8.2	8.9	12.6	9.5	119.9	141.9	103.5
9.6	17.3	4.7	11.5	15.2	4.8	11.6	14.3	4.1	10.2	13.4	7.4	9.8	14.0	6.2	8.2	15.2	7.6	109.8	170.5	85.0
10.2	15.3	5.5	13.2	14.0	3.8	11.5	13.8	4.7	8.0	13.5	9.5	12.8	10.7	6.5	10.3	14.2	6.5	120.7	164.6	80.0
10.8	15.0	5.2	12.8	13.2	5.0	12.4	12.1	5.5	11.7	11.7	7.6	10.6	12.7	6.7	9.7	12.7	8.6	126.1	151.7	87.5
8.5	16.6	5.9	10.5	15.8	4.7	8.8	14.7	6.5	7.5	13.8	9.7	5.5	15.2	9.3	7.6	16.3	7.1	99.4	175.2	90.7
9.8	16.2	5.0	12.0	14.8	4.2	10.2	14.0	5.8	7.2	10.6	13.2	6.0	15.6	8.4	10.0	15.6	5.4	118.8	170.2	76.3
10.6	15.6	4.8	13.4	13.7	3.9	12.0	12.6	5.4	10.0	12.0	9.0	7.7	12.9	9.4	8.4	14.4	8.2	107.9	162.7	94.7
11.0	14.7	5.2	15.5	11.8	3.7	12.5	12.6	4.9	8.0	13.3	9.7	6.2	16.0	7.8	8.7	15.4	6.9	116.7	166.7	81.9
12.2	15.3	2.5	15.6	13.2	2.2	11.6	13.4	5.0	9.2	12.8	9.0	7.8	14.2	8.0	9.0	14.4	7.6	132.3	165.3	67.7
14.5	13.4	3.1	17.0	11.0	3.0	10.3	13.5	6.2	6.7	13.4	10.9	7.4	13.2	9.4	5.8	15.0	10.2	109.6	155.8	99.9
11.5	15.8	3.7	14.8	13.6	2.6	14.0	11.5	4.5	9.2	12.5	9.3	7.7	16.5	5.8	7.0	12.3	11.7	104.0	180.5	81.0
13.8	14.8	2.4	18.0	11.0	2.0	14.8	11.8	3.4	9.6	15.6	5.8	9.6	14.4	6.0	8.1	15.1	7.8	113.2	176.3	75.8
11.5	15.5	4.0	16.6	9.7	4.7	14.3	8.0	7.7	10.0	13.0	8.0	9.7	12.7	7.6	8.7	11.7	10.6	120.5	187.0	106.0
15.0	13.4	2.6	17.6	10.6	2.8	14.2	10.8	5.0	8.4	14.6	8.0	10.0	13.4	6.6	8.8	14.0	8.2	127.5	165.8	72.0
15.2	12.8	3.0	15.6	11.8	3.6	18.6	8.6	2.8	14.9	11.2	4.9	14.4	9.6	6.0	10.9	13.1	7.0	143.8	151.4	70.2
13.1	12.8	5.1	12.5	14.4	4.1	16.4	9.8	3.8	15.2	10.6	5.2	13.5	12.0	4.5	13.1	12.8	5.1	149.6	153.3	62.4
10.1	16.5	4.4	12.9	14.7	3.4	13.0	13.3	3.7	12.2	13.3	5.5	10.7	15.1	4.2	9.8	14.3	6.9	124.1	174.2	67.0
12.2	14.7	4.1	11.8	14.4	4.8	17.1	9.1	3.8	15.8	10.2	5.0	15.5	10.6	8.9	14.1	13.9	3.0	161.1	148.2	56.0
7.5	17.2	6.3	7.4	17.6	6.0	18.6	12.9	3.5	15.2	11.5	4.3	14.5	9.8	5.7	12.3	13.7	5.0	131.8	167.6	69.5
10.6	15.6	6.0	12.7	12.6	5.7	16.3	10.7	3.0	15.8	10.0	5.7	17.0	11.3	1.7	9.7	15.7	5.6	139.0	165.0	61.5
10.9	14.8	5.3	14.5	12.1	4.4	14.8	11.4	3.8	16.2	8.5	6.3	14.1	10.8	5.1	12.3	12.1	6.6	149.8	143.3	72.2
11.4	12.4	7.2	15.4	10.9	4.7	17.4	7.6	5.0	16.2	7.6	7.2	17.0	7.3	5.7	17.1	7.2	6.7	183.8	111.6	69.9
12.2	14.3	4.5	15.9	12.7	2.4	14.4	10.7	4.9	13.8	11.6	5.6	11.4	11.3	7.3	10.0	11.4	9.6	147.3	145.9	72.0
15.1	11.6	4.3	14.8	13.1	3.1	13.0	10.9	6.1	14.1	10.3	6.6	13.8	9.7	6.5	14.4	8.2	8.4	162.7	128.9	73.7
15.8	11.8	3.4	16.0	10.4	4.6	16.5	8.7	4.8	17.0	9.9	4.1	14.2	7.5	8.3	17.5	9.4	4.1	199.2	114.9	51.2
14.1	13.1	3.8	16.9	11.8	2.3	16.5	9.4	4.1	17.8	8.7	4.5	18.1	5.9	6.0	17.0	8.4	5.6	203.0	111.8	50.5
7.1	13.4	5.5	7.5	18.0	5.5	14.9	12.7	2.4	18.8	9.9	2.3	15.4	10.9	3.7	15.2	10.8	5.0	156.2	163.0	46.1
18.3	17.2	3.5	16.7	11.4	2.9	20.4	6.7	2.9	20.7	8.5	1.8	19.7	7.3	3.0	19.7	8.6	2.7	223.6	109.7	32.0

Average number of clear, fair, and cloudy days at stations

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Southern Plateau.—Continued:																		
Apache, Fort, Ariz	15.3	10.2	5.5	13.7	8.5	6.2	17.0	8.3	5.7	17.0	10.7	2.3	23.2	6.2	1.6	22.8	5.5	2.2
Grant, Fort, Ariz	16.2	9.5	5.3	13.2	8.5	6.7	16.0	9.7	5.3	20.4	8.6	1.0	22.9	6.0	2.1	19.8	9.0	1.7
Prescott, Ariz	18.1	10.8	2.1	17.2	7.5	3.0	17.8	9.3	3.9	19.7	8.1	2.2	24.2	5.9	0.9	24.7	4.6	0.7
Thomas, Camp, Ariz	16.3	12.4	2.3	12.0	12.2	4.0	16.0	10.2	4.8	18.8	8.8	2.4	23.6	6.4	1.0	20.0	8.4	1.6
Yuma, Ariz	20.8	8.3	2.4	18.6	7.1	2.7	21.8	7.3	1.9	23.4	5.6	1.0	27.2	3.1	0.7	27.1	2.7	0.2
Middle Plateau:																		
Winnemucca, Nev	11.7	12.0	7.3	10.0	10.5	7.7	13.2	11.1	6.7	10.7	12.2	7.1	13.3	12.2	5.5	15.0	12.6	2.4
Salt Lake City, Utah	8.2	11.6	11.2	7.5	10.8	10.0	9.7	10.8	10.5	7.6	12.6	9.8	10.7	13.0	7.3	15.2	11.7	3.1
Northern Plateau:																		
Boisé City, Idaho	7.3	9.3	14.4	6.3	10.3	11.7	9.0	12.6	9.4	8.0	13.3	8.7	9.1	15.2	6.7	11.3	14.1	4.6
Lewiston, Idaho	4.0	9.4	17.6	6.4	9.4	12.6	9.6	12.6	8.8	10.2	11.4	8.4	11.2	13.2	6.6	10.6	12.6	6.8
Dayton, Wash	3.0	11.0	17.0	7.0	9.6	11.8	9.6	13.6	7.8	9.0	11.2	9.8	10.8	13.0	7.2	10.0	13.8	6.2
Spokane Falls, Wash	6.0	12.7	12.3	7.5	8.0	12.8	10.2	12.5	8.3	9.2	12.0	8.8	9.8	14.7	6.5	9.0	13.2	7.8
North Pacific Coast:																		
Canby, Fort, Wash	8.0	10.0	13.0	13.0	10.0	6.0	7.0	19.0	5.0	7.0	16.0	7.0	8.0	15.0	8.0	2.0	17.0	11.0
Olympia, Wash	2.3	9.3	19.4	3.4	7.4	17.4	4.6	10.4	16.0	4.3	12.3	13.4	6.6	11.3	13.1	6.0	11.1	12.9
Tatoosh Island, Wash	9.0	4.0	18.0	10.0	9.0	10.0	4.0	13.0	14.0	8.0	8.0	14.0	11.0	11.0	9.0	3.0	12.0	15.0
Portland, Oreg	3.9	7.2	19.9	2.8	6.4	19.0	4.4	7.5	19.1	5.3	9.1	15.6	5.5	10.0	15.5	6.9	9.6	13.5
Roseburg, Oreg	3.2	10.0	17.8	4.1	8.1	16.0	6.7	10.4	13.9	4.3	10.7	15.0	8.7	11.8	11.0	11.0	9.9	9.1
Middle Pacific Coast:																		
Cape Mendocino, Cal	9.0	8.0	14.0	13.0	8.0	8.0	11.5	8.0	11.5	6.0	13.5	10.5	11.0	15.0	5.0	13.5	12.5	4.0
Red Bluff, Cal	13.9	8.3	8.8	11.4	8.9	8.0	13.7	10.8	7.0	13.0	9.9	7.1	15.9	10.0	5.1	23.4	4.7	1.9
Sacramento, Cal	12.6	9.9	8.5	12.2	8.3	7.7	15.4	7.6	8.0	14.4	9.9	5.7	20.0	7.7	3.3	24.8	4.0	1.2
San Francisco, Cal	11.7	10.1	9.2	9.5	10.2	8.5	11.5	11.4	8.1	12.0	11.6	6.4	14.4	10.7	5.9	12.8	10.9	6.8
South Pacific Coast:																		
Los Angeles, Cal	17.4	8.4	5.2	12.7	9.3	6.3	12.0	10.9	8.1	10.3	12.6	7.1	12.6	12.4	6.0	8.4	16.0	5.6
San Diego, Cal	11.5	11.3	8.2	8.9	11.3	8.0	8.4	13.1	9.5	9.7	12.7	7.6	7.5	12.6	10.9	6.8	15.0	8.2
Alaska Stations:																		
Saint Michael's, Fort, Alaska	6.4	9.4	15.2	12.4	7.0	8.9	8.5	10.4	12.1	5.7	9.9	15.3	4.1	9.9	17.0	3.5	10.7	15.8
Sitka, Alaska	4.3	9.2	17.5	7.5	9.2	11.7	7.0	8.2	15.8	6.8	9.6	13.6	5.8	9.8	15.4	6.7	6.2	17.1
Unalashka, Alaska	1.6	5.4	24.0	0.8	3.6	24.0	2.8	6.4	21.8	1.4	4.7	23.9	0.8	8.2	22.0	0.8	5.5	23.7

of the Signal Service, United States Army, &c.—Continued.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
10.7	12.7	7.6	10.1	14.9	6.0	18.0	8.0	4.0	21.6	7.1	2.3	21.4	6.8	2.3	17.0	8.9	5.1	207.5	109.0	48.8
8.7	15.9	6.4	9.4	15.0	6.6	20.1	7.4	2.5	21.5	6.9	2.6	20.1	7.3	2.6	17.1	7.9	6.0	208.5	118.8	48.5
16.6	11.6	2.8	15.2	13.1	2.7	24.1	4.8	1.1	23.2	6.5	1.3	22.4	6.8	1.8	19.5	8.7	2.8	234.8	102.0	28.6
12.0	14.4	4.6	10.4	16.8	3.8	19.8	7.8	2.4	20.3	8.2	2.5	20.4	7.6	2.0	16.8	9.4	4.8	204.3	124.8	36.2
23.0	7.3	0.7	2.8	7.7	1.5	26.1	3.6	0.3	23.8	6.5	0.7	22.9	5.9	1.2	21.6	7.4	2.0	279.9	71.1	14.8
24.0	6.3	0.7	25.8	4.3	0.9	22.2	5.5	2.3	18.5	9.8	2.7	15.5	10.5	4.0	13.3	10.0	7.7	189.8	117.5	57.9
16.5	11.8	2.7	16.2	11.9	2.9	17.7	9.0	2.7	12.8	11.6	6.6	10.8	10.7	8.5	8.3	9.9	12.8	143.3	133.8	88.2
18.1	11.6	1.3	21.7	8.0	1.3	16.6	8.9	4.5	12.4	10.6	8.0	11.0	10.8	8.2	7.8	9.1	14.6	184.6	131.9	98.8
16.8	11.4	2.8	22.3	7.0	1.7	16.0	10.0	4.0	9.0	11.0	11.0	8.0	9.8	11.6	7.0	8.2	15.8	182.3	125.5	107.6
17.4	10.8	2.8	21.8	8.2	1.0	13.4	12.6	4.0	9.0	12.6	9.4	10.4	10.4	9.2	5.3	9.8	16.4	127.4	136.8	101.2
12.5	12.0	5.5	20.8	8.5	1.7	13.8	11.5	4.7	6.5	11.5	13.0	5.0	12.8	12.2	4.8	11.5	14.7	129.8	137.3	98.7
1.0	16.0	14.0	11.0	14.0	6.0	10.6	9.7	9.7	10.0	11.0	10.0	9.5	8.0	12.5	6.7	13.5	10.8	101.6	158.8	105.6
10.7	13.0	7.3	11.0	13.6	6.4	6.1	12.0	11.9	3.6	12.0	15.4	2.5	9.6	17.9	2.0	7.6	21.4	64.1	127.9	173.3
2.0	14.0	15.0	14.0	10.0	7.0	4.0	15.0	11.0	7.5	11.5	12.0	3.0	9.0	18.0	5.5	9.0	16.5	81.0	128.0	157.0
14.7	7.7	8.6	14.8	0.1	7.1	11.8	10.0	8.2	7.2	10.0	13.8	5.2	8.9	15.9	4.1	7.5	19.4	87.8	103.1	174.9
17.2	9.8	4.0	19.9	9.0	2.1	15.6	8.9	5.5	7.0	13.7	10.3	3.7	13.8	12.9	2.0	10.7	18.3	108.4	125.8	136.1
19.0	10.0	2.0	23.7	6.3	1.0	19.0	8.0	3.0	15.0	12.3	3.7	10.8	14.4	4.8	8.0	12.5	10.5	165.0	132.5	68.0
27.7	3.2	0.1	28.5	2.4	0.1	25.2	3.9	0.9	21.2	7.3	2.5	20.2	5.4	4.4	12.8	9.6	8.6	227.7	81.7	55.3
29.6	1.3	0.1	20.5	1.5	0.0	25.9	3.6	0.5	23.4	5.5	2.1	19.6	6.5	3.0	13.2	8.0	9.8	240.0	74.9	50.4
8.2	15.4	7.4	9.3	14.8	6.9	12.9	12.6	4.5	15.2	11.5	4.3	14.9	9.6	5.5	12.9	9.5	8.6	146.7	139.0	79.6
12.1	18.1	0.8	16.6	13.3	1.1	17.5	11.1	1.4	17.5	10.6	2.9	19.0	9.0	2.0	17.0	8.9	5.1	171.3	142.4	51.6
8.2	16.6	6.2	9.5	17.1	4.4	12.1	13.6	4.3	13.2	12.3	5.5	13.6	10.4	6.0	12.9	11.4	6.7	122.3	157.6	85.4
3.2	7.4	20.4	2.1	6.3	22.6	1.9	8.2	19.9	2.6	8.6	19.8	6.7	9.0	14.3	9.6	9.6	11.8	65.9	106.2	193.1
2.0	8.6	19.4	7.4	9.2	14.4	8.6	7.0	14.4	7.0	8.0	16.0	3.5	6.9	19.6	7.2	8.8	15.0	72.8	113.5	189.2
1.0	8.5	21.5	2.5	7.0	21.5	0.8	5.2	24.0	1.3	6.0	23.7	1.2	6.0	22.8	1.0	6.4	28.6	14.0	102.0	249.0

APPENDIX 50.

Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads and connecting branches during each month of the year 1884.

[Copied from the records on file at the office of the chief engineer of the Central Pacific Railroad.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Alta, Cal	S.	SE.	S.	S.	NE.	S.	S.	S.	S.	S.	N.	S.	S.
Anaheim, Cal	N.	W.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SE.	SW.
Antioch, Cal	SE.	NW.	W.	W.	W.	W.	W.	W.	(1)	W.	W.	W.	......
Aptos, Cal	(1)	(1)	(1)	(1)	(1)	(1)	NW.	N.	SW.	NE.	NE.	NE.	......
Auburn, Cal	SE.	SE.	SE.	SE.	SE.	SE.	E.	E.	E.	S.	E.	S.	SE.
Battle Mountain, Nev	SW.	SW.	NE.	NE.	SW.	SW.	SW.	S.	S.	SW.	SE.	W.	SW.
Benson, Ariz	W.	S.	W.	W.	SW.	(1)	W.	W.	W.	W.	E.	W.	......
Beowawe, Nev	S.	S.	S.	W.	S.	W.	N.	N.	SE.	S.	S.	S.	S.
Bishop Creek, Nev	(1)	(1)	N.	N.	S.	S.	W.	S.	N.	S.	S.	N.	......
Blue Creek, Utah	E.	E.	SW.	S.	S.	NE.	NE.	N.	N.	N.	N.	SW.	N.
Boca, Cal	N.	SW.	N.	SW.	SW.	SW.	S.	SW.	SW.	W.	W.	SW.	SW.
Borden, Cal	SE.	SE.	SE.	NE. SE.	NW.	NW.	NW.	NW.	NW.	NW.	SW.	SE.	NW.
Brentwood, Cal	NW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Brighton, Cal	N.	N.	SE.	SE.	S.	S.	S.	SW.	N.	N.	N.	SE.	N.
Brown's, Nev	SW.	SW.	SW.	SW.	SW.	SW.	SE.	SW.	SW W.	W.	(1)	SW.	......
Byron, Cal	NW.	W.	SE.	W.	NW.	W.	W.	W.	W.	W.	W.	SE.	W.
Cabazon, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	W.	W.	W.	E.	W.	......
Caliente, Cal	W.	SE.	W.	W.	W.	W.	E.	W.	W.	W.	W.	W.	W.
Calistoga, Cal	SE.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	SW.	W.
Carlin, Nev	N.	W.	W.	W.	W.	W.	W.	W.	W.	W.	N.	W.	W.
Casa Grande, Ariz	E.	W.	W.	SW.	N.	N.	W.	W.	S.	SW.	W.	W.	W.
Chico, Cal	S.	N.	S.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.
Chualar, Cal	S.	S.	S.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Cisco, Cal	SW.	SW.	SW.	SW.	NE.	SW.	SW.	E.	SW.	SW.	SW.	SW.	SW.
Colfax, Cal	N.	S.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	S.	SW.
Colton, Cal	N.	SE.	W.	W.	W.	SW.	SW.	W.	SW.	SW.	N.	SW.	SW.
Corinne, Utah	N.	N.	S.	N.	S.	S.	S.	N.	N.	N.	N.	N.	N.
Daggett, Cal	W.	W.	W.	W.	W.	W.	W.	W.	(2)	......	......	......	......
Davisville, Cal	N.	N.	S.	S.	W.	S.	W.	S.	S.	S.	W.	S.	S.
Delano, Cal	S.	S.	SW.	SW.	(1)	S.	SE.	SE.	SE.	E.	SE.	SE.	......
Delta, Cal	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	N.	NW.	N.	......
Deming, N. Mex	E.	W.	W.	W.	W.	W.	W.	W.	SW.	E.	E.	E.	W.
Dunnigan, Cal	S.	N.	S.	N.	N.	S.	SE.	SE.	N.	N.	N.	N.	N.
Elko, Nev	N.	N.	W.	N.	N.	W.	W.	N.	N.	W.	N.	W.	N.
El Paso, Tex	N.	W.	S.	S.	S.	(1)	(1)	S.	(1)	W.	N.	W.	......
Emigrant Gap, Cal	E.	E.	S.	S.	E.	E.	E.	E.	SE.	E.	E.	SE.	E.
Farmington, Cal	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NW.
Fenner, Cal	SW.	W.	E.	E.	W.	W.	W.	(1)	SE.	(2)	......	......	......
Fresno City, Cal	SE.	SE.	SE.	N.	N.	NW.	NW.	(1)	NW.	NW.	SE.	S.	......
Galt, Cal	SE.	SE.	SE.	SE.	NW.	W.	W.	NW.	W.	NW.	W. NW.	SE.	SE.
Gilroy, Cal	N.	W.	SW.	W.	W.	W.	W.	W.	W.	N.	S.	S.	W.
Golconda, Nev	E.	SW.	W.	E.	NW.	(1)	SW.	W.	W.	E.	E.	NW.	......
Goshen, Cal	SE.	SE.	SW.	SE.	NW.	NW.	NW.	NW.	NW.	(1)	(1)	SW.	......
Halleck, Nev	S.	SW.	SW.	SW.	SW.	SW.	SW.	S.	(1)	SW.	SW.	SW.	......
Hawthorne, Nev	(1)	(1)	NW.	W.	NW.	NW.	NW.	NW.	N.	NW.	NW.	SW.	......
Hollister, Cal	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NW
Hot Springs, Nev	NW.	(1)	N.	N.	N.	NE.	N.	W.	SW.	NW.	NE.	SW.	......
Humboldt, Nev	NE.	SW.	N.	N.	SW.	N.	SW.	(1)	N.	S.	(1)	N.	......
Indio, Cal	N.	SW.	(1)	NW.	NW.	NW.	NE.	NE.	NE.	NE.	W.	NE.	......
Ione, Cal	SW.	SW.	SW.	SW.	(1)	SW.	SW.	SW.	SW.	SW.	SW.	SE.	......
Keeler, Cal	(1)	(1)	(1)	S.	S.	N.	N.	N.	N.	N.	N.	N.	......
Keene, Cal	SE.	SE.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	SE.	S.	SE. NW.	......
Kelton, Utah	N.	S.	S.	N.	W.	N.	W.	S.	N.	(1)	S.	S.	......
Kingsburg, Cal	SE.	SE.	SE.	N.	N.	N.	(1)	N.	N.	N.	N.	S.	......
Knight's Landing, Cal	N.	N.	N.	S.	S.	S.	SE.	(1)	SE.	N.	(1)	S.	......
Lathrop, Cal	SE.	SE.	SE.	SE.	W.	W.	W.	(1)	NW.	W.	W.	S.	......

(1) No record. (2) Observations discontinued.

Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Lemoore, Cal	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	NW.	......
Livermore, Cal	E.	SW.	SW.	SW.	W.	W.	W.	W.	W.	W.	SW.	SW.	W.
Lordsburg, N. Mex	SE.	SE.	SE.	SW.	SW.	SE.	SE.	SE.	SE.	W.	W.	SE.	SE.
Los Angeles, Cal	NW.	SW.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Mammoth Tank, Cal	NE.	NE.	SW.	SW.	SW.	NE.	NE.	SW.	NE.	NW.	(1)	SW	......
Maricopa, Ariz	(1)	W.	W.	W.	W.	E.	E.	E.	E.	E.	E.	E.	......
Martinez, Cal	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	N.	SW.
Marysville, Cal	S.	S.	S.	S.	S & N.	S.	S.	S.	S.	S.	S.	S.	S.
Menlo Park, Cal	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	......
Merced, Cal	N.	N.	S.	N.	N.	N.	N.	N.	N.	N.	N.	S.	N.
Modesto, Cal	S.	S.	S.	S.	NW.	NW.	N.	(1)	N.	S.	S.	S.	......
Mojave, Cal	(1)	NW.	SW.	SE.	SE.	SE.	SE.	SE.	(1)	NW.	(1)	(1)	......
Monterey, Cal	SE.	NW.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	SE.	NW.
Napa City, Cal	NW.	SE.	W	W.	W.	SW.	NW.	W.	(1)	S.	S.	S.	......
Needles, Ariz	NW.	S.	NW.	NW.	NW.	SE.	E.	SE.	SE.	(2)	......	......	......
Newhall, Cal	NE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Niles, Cal	SE.	NE.	SW.	SE.	W.	SW.	W.	W.	NW.	NW.	NW.	NW.	NW.
Oakland, Cal	S.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	N.	W.
Ogden City, Utah	S.	S.	S.	E.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Orland, Cal	N.	N.	N.	S.	S.	S.	SE.	N.	N.	N.	N.	N.	N.
Otego, Nev	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Pajaro, Cal	(1)	E.	SW.	(1)	W.	S.	SW.	(1)	S.	W.	W.	SW.	......
Palisade, Nev	W.	W.	N.	N.	N.	W.	W.	SW.	S.	SW.	SE.	SE.	W.
Pantano, Ariz	E.	E.	E & W	E.	E.	(1)	W.	W.	E.	E.	E.	E.	......
Petaluma, Cal	SE.	W.	W.	W.	W.	W.	W.	W.	W.	(1)	W.	E.	......
Pleasanton, Cal	S.	S.	S.	S.	SW.	S.	S.	S.	S.	S.	S.	S.	S.
Promontory, Utah	NE.	NE.	NE.	NE.	NE.	SW.	SW.	S.	SW.	SW.	(1)	SW.	......
Ravenna, Cal	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	SW.
Red Bluff, Cal	N.	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N. & S.
Redding, Cal	(1)	(1)	(1)	SW.	SW.	SW.	SW.	(1)	SW.	N.	N. SE.	N.	......
Reno, Nev	E.	SW.	SW.	SW.	N.	SW.	W.	W.	W.	W.	W.	SW.	W. SW.
Rocklin, Cal	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	(1)	SE.	(1)	SE.	S. E.
Sacramento, Cal	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.
Salinas, Cal	S.	S.	S.	S.	W.	S.	W.	W.	S.	S.	W.	S.	S.
San Fernando, Cal	S.	S.	S.	S.	S.	(1)	S.	SE.	SW.	S.	N.	N.	......
San José, Cal	S.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	......
San Mateo, Cal	NW.	NW.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	NW.	S.	......
San Simon, Ariz	E.	E.	W.	W.	W.	W.	W.	W.	E & W	E.	E.	W.	W.
Santa Cruz, Cal	NE.	NE.	NE.	N.	S.	S.	N.	SE.	N.	N.	N.	S.	N.
Soledad, Cal	S.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	S.	NW.
Soquel, Cal	N.	N.	N.	N & S.	N.	N.	N.	(1)	N.	N.	N.	N.	N.
South Vallejo, Cal	SE.	SW.	SE.	W.	SW.	SW.	SW.	SW.	(1)	SW.	SE.	W. NW.	....
Spadra, Cal	N.	E.	S.	W.	W.	N.	W.	S.	S.	W.	W.	N.	W.
Stockton, Cal	SE.	SE.	S.	SE.	W.	NW.	W.	W.	W.	W.	W.	SE.	W.
Suisun, Cal	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	SW.
Summit, Cal	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Sumner, Cal	N.	N.	N.	N.	N.	N.	W.	W.	S.	W.	W.	S.	N.
Tecoma, Nev	W.	W.	W.	SW.	W.	W.	W.	W.	W.	SW.	(1)	SW.	......
Tehama, Cal	N.	N.	N.	S.	(1)	S.	S.	S.	(1)	N.	N.	N.	......
Tehichipa, Cal	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NE.	NW.
Tennant, Cal	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Terrace, Utah	NW.	NW.	NW.	W.	W.	W.	W.	SW.	W.	(1)	N.	W.	....
Texas Hill, Ariz	N.	S.	W.	W.	W.	S & W	E.	S.	S.	SW.	E.	SW.	W & S
Toano, Nev	S.	S.	SW.	S.	S.	W.	W.	W.	W.	W.	W.	W.	W.
Tracy, Cal	S.	W.	S.	S.	W.	W.	W.	W.	W.	W.	W.	SE.	W.
Truckee, Cal	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	(1)	W.	NW.	N.	......
Tucson, Ariz	SW.	W.	E.	SE.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Tulare, Cal	S.	N.	SW.	S.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	S.	NW.
Turlock, Cal	SW.	S.	S.	S.	N.	N.	N.	N.	N.	N.	S.	S.	N.
Wadsworth, Nev	SE.	N.	W.	W.	N.	W.	W.	S.	S.	N.	E.	S.	W.
Wells, Nev	SW.	W.	SW.	S.	SW.	SW.	W.	SW.	W.	W.	S.	SW.	SW.
Willcox, Ariz	N.	W.	W.	W.	W.	W.	E.	E.	W.	E.	E.	W.	W.
Williams, Cal	N.	N.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.	S.
Willow, Cal	S.	S.	S.	S.	S.	S.	S.	S.	W.	S.	S.	N.	S.
Winnemucca, Nev	NE.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	SW.	SW.
Woodland, Cal	N.	N.	N.	N.	S.	S.	S.	S.	N.	(1)	S.	N.	......
Yuma, Ariz	NE.	NE.	W.	W.	NW.	(1)	SE.	NW.	(1)	SW.	SE.	(1)	......

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[1] No record.

[2] Observations discontinued.

APPENDIX 51.

Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, during each month of the year. (Computed from the commencement of observations at each to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New England:												
Eastport, Me	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	NW.	NW.
Portland, Me	NW.	NW.	NW.	NW.	S	S.	S.	S.	S.	SW.	NW.	W.
Mt. Washington, N. H	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Boston, Mass	NW.	NW.	NW.	NW.	SW.	SW W.	SW.	W.	SW.	W.	W.	W.
Block Island, R. I	N.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.
New Haven, Conn	NW.	NW.	NW.	NW.	S.	S.	S.	S.	SW.	SW.	NW.	N.
New London, Conn	NW.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	N.	N.	NW.	NW.
Middle Atlantic States:												
Albany, N. Y	S.	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	NW.	NW.
New York City	W.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	NW.	W.	W.
Philadelphia, Pa	NW.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.
Atlantic City, N. J.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	SW.	NW.	NW.
Barnegat City, N. J.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	SW.	NW.	NW.	NW.
Cape May, N. J	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	NW.	NW.
Sandy Hook, N. J	W.	NW.	NW.	NW.	SE.	SE.	SW.	SW.	SW.	NW.	NW.	W.
Del. Breakwater, Del.	NW.	NW.	NW.	NW.	NE.	SW.	S.	NE.	SW.	NE.	NW.	NW.
Baltimore, Md	NW.	NW.	NW.	NW.	SE.	S.	SW.	S.	N.	NW.	NW.	NW.
Washington City	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	NW.	NW.
Cape Henry, Va	NW.	N.	NW.	S.	SE.	SE.	SW.	NE.	NE.	NE.	NW.	SW.
Chincoteague, Va	NW.	NW.	NW.	NW.	S.	S.	S.	NE.	S.	S.	NW.	NW.
Lynchburg, Va	SW.	NW.	NW.	NE.	S.	SW.	SW.	NE.	NE.	NE.	W.	SW.
Norfolk, Va	N.	NE.	N.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	N.	N.
South Atlantic States:												
Charlotte, N. C	NE SW	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.	SW.
Hatteras, N. C	SW.	NE.	NE.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Kitty Hawk, N. C	NE.	NE.	NE.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Macon, Fort, N. C	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	N.	N.
Smithville, N. C	N.	N.	SW.	SW.	SW.	SW.	SW.	SW.	N.	N.	N.	N.
Wilmington, N. C	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.
Charleston, S. C	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	NE.
Augusta, Ga	NW.	NW.	NW.	NW.	SE.	S.	SE.	NE.	NE.	NE.	NW.	NW.
Savannah, Ga	NW.	NW.	S.	SW.	S.	SW.	SW.	SW.	NE.	NE.	N.	NW.
Jacksonville, Fla	NE.	NE.	SW.	SW.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Florida Peninsula:												
Cedar Keys, Fla	NE.	NE.	SW W.	SW.	W.	W.	W.	NE.	NE.	NE.	NE.	NE.
Key West, Fla	NE.	E.	E.	E.	E.	E.	E.	E.	E.	NE.	NE.	NE.
Sanford, Fla	NW.	SE.	SW.	SW.	SW.	E.	SW.	NE.	NE.	NE.	NE.	NE.
Eastern Gulf States:												
Atlanta, Ga	NW.	NW.	NW.	NW.	E.	NW.	W.	E.	E.	E.	NW.	NW.
Pensacola, Fla	N.	SE.	S.	S.	SE.	SW.	SW.	S.	SE.	NE.	N.	N.
Mobile, Ala	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Montgomery, Ala	NW.	NW.	NW.	S.	SE.	SE.	SW.	E.	E.	E.	NW.	NW.
Vicksburg, Miss	N.	SE.	S.	S.	SE.	SW.	SW.	SE.	N.	N.	SE.	SE.
New Orleans, La	N.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	E.	E.	N.	N.
Western Gulf States:												
Shreveport, La	S.	S.	S.	S.	S.	S.	S.	SE.	SE.	SE.	S.	S.
Fort Smith, Ark	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.
Little Rock, Ark	NW.	NW.	NW.	S.	S.	S.	SW.	NE.	NE.	SE.	S.	NW.
Galveston, Tex	N.	SE.	SE.	SE.	SE.	S.	S.	SE.	SE.	SE.	N.	N.
Indianola, Tex	N.	S.	SE.	S.	SE.	S.	S.	S.	SE.	SE.	N.	N.
Palestine, Tex	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Rio Grande Valley:												
Brownsville, Tex	N.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	N.	N.
Rio Grande City, Tex	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Ohio Valley and Tennessee:												
Chattanooga, Tenn	NE.	S.	NW.	SW.	S.	SW.	SW.	NE.	NE.	NE.	S.	S.
Knoxville, Tenn	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	NE.	SW.
Memphis, Tenn	NW.	NW.	SE.	SE.	SE.	SW.	SW.	NW.	NW.	NW.	NW.	NW.

Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ohio Valley and Tennessee—Continued:												
Nashville, Tenn	NW.	NW.	NW.	NW.	S.	W.	W.	NW.	NW.	SE.	NW.	NW.
Louisville, Ky	SW.	S.	W.	S.	S.	S.	SW.	N.	S.	S.	S.	W.
Indianapolis, Ind	W.	NW.	NW.	NW.	SE.	SW.	SW.	N.	S.	S.	S.	W.
Cincinnati, Ohio	SW.	NW.	NW.	NW.	SE.	SE.	SW.	NE.	SE.	SE.	SE.	NW.
Columbus, Ohio	S.	W.	W. NW	W.	S.	SW.	S.	N. S.	S.	S.	S.	W.
Pittsburg, Pa	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.
Lower Lakes:												
Buffalo, N. Y	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	W.
Oswego, N. Y	SE. S.	S. NW	NW.	W.	W.	W.	W.	S.	S.	S.	S.	S.
Rochester, N. Y	W.	W.	W.	W.	W.	W.	W.	SW.	SW.	SW.	W.	W.
Erie, Pa	SW.	W.	W.	NE.	W.	S.	W.	S.	S.	S.	S.	SW.
Cleveland, Ohio	SW.	W.	W.	NE.	SE.	SE.	N.	SE.	SE.	SE.	SW.	SW.
Sandusky, Ohio	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Toledo, Ohio	SW.	SW.	W.	W.	NE SW	SW.	SW.	SW.	S.	SW.	SW.	SW.
Detroit, Mich	SW.	W.	NW.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	W.	SW.
Upper Lakes:												
Alpena, Mich	W.	W.	NW.	NW.	NW.	SE.	NW.	NW.	NW.	NW.	W.	W.
Escanaba, Mich	NW.	N.	N.	N.	S.	S.	S.	S.	S.	S.	W.	W.
Grand Haven, Mich	W.	W.	NW.	NW.	SW.	SW.	SW.	SW.	S.	S.	W.	W.
Mackinaw City, Mich	W.	W.	NW.	E.	W.	W.	W.	NW.	E.	NW.	NW.	NW.
Marquette, Mich	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.	W.	W.
Port Huron, Mich	S.	S.	N.	N.	NE.	S.	S.	NE.	S.	S.	S.	SW.
Chicago, Ill	SW.	SW.	NW.	N.	N.	SW.	SW.	NE.	SW.	SW.	SW.	SW.
Milwaukee, Wis	NW.	NW.	NW.	NE.	NE.	SW.	SW.	SW.	SW.	SW.	NW.	W.
Duluth, Minn	SW.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	SW.	SW.
Upper Mississippi Valley:												
Saint Paul, Minn	NW.	SE.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
La Crosse, Wis	S.	S.	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.
Davenport, Iowa	NW.	NW.	NW.	NW.	E	SW.	SW.	SW.	SW.	SW.	NW.	NW.
Des Moines, Iowa	N.	NW.	N.	N.	SW.	S.	SW.	SW.	SW.	S.	NW.	NW.
Dubuque, Iowa	NW.	NW.	NW.	NW.	SE.	SE.	S.	S.	S.	NW.	NW.	NW.
Keokuk, Iowa	NW.	NW.	NW.	NE.	S.	S.	SW.	S.	S.	S.	NW.	NW.
Cairo, Ill	S.	S.	S.	S.	S.	S	S.	S.	S.	S.	S.	S.
Springfield, Ill	S	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Saint Louis, Mo	S.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Missouri Valley:												
Leavenworth, Kans	S.	S.	N.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Omaha, Nebr	NW.	N.	N.	N.	SE.	S.	S.	S.	S.	S.	NW.	NW.
Bennett, Fort, Dak	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
Huron, Dak	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
Yankton, Dak	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.
Extreme Northwest:												
Moorhead, Minn	N.	N.	N.	N.	N.	S.	S.	SE.	S.	SE.	S.	N.
Saint Vincent, Minn	NW.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.	NW.
Bismarck, Dak	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Buford, Fort, Dak	NW.	W.	NW.	E.	E.	E.	E.	E.	W.	W.	W.	W.
Northern Slope:												
Assinaboine, Fort, Mont	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Benton, Fort, Mont	W.	SW.	W.	NE.	W.	W.	SW.	W.	SW.	SW.	SW.	SW.
Custer, Fort, Mont	SE.	SW.	SE.	NW.	SE.	NW.	SE.	SE.	N.	N.	SE.	N.
Helena, Mont	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Maginnis, Fort, Mont	W.	W.	W.	W.	W.	SW.	SW.	NW.	NW.	NW.	W.	W.
Poplar River, Mont	NW.	NW.	NW.	SW.	SE.	SW.	NW.	SE.	W.	W.	W.	NW.
Shaw, Fort, Mont	SW.	SW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	SW.
Deadwood, Dak	SW.	SW.	SW.	NE.	NE. SW.	SW.	SW.	NE.	NE.	NE.	SW.	NE.
Cheyenne, Wyo	W.	W.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.
North Platte, Nebr	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	NW.	NW.	NW.
Middle Slope:												
Denver, Colo	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Pike's Peak, Colo	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	W.
West Las Animas, Colo	W.	W.	E.	W.	E.	E.	E.	E.	S.	NE.	NW.	W.
Dodge City, Kans	N.	N.	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.
Elliott, Fort, Tex	N.	S.	NE.	S.	SE.	S.	SE.	SE.	S.	SE.	NW.	N.
Southern Slope:												
Sill, Fort, Ind. T	N.	N.	N.	S.	S.	S.	SE.	SE.	S.	S.	N.	N.
Concho, Fort, Tex	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	SW.
Davis, Fort, Tex	SW.	SW.	SW.	SW.	SW.	SW.	E.	E.	NE.	SW.	SW.	SW.
Stockton, Fort, Tex	SW.	SW.	SW.	SE.	SE.	SE.	SE.	SE.	SE.	S.	SW.	SW.

Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Southern Plateau:												
Santa Fé, N. Mex....	N.	N.	SW.	SW.	E. SW.	SW.	E.	E.	E.	SW.	N.	N.
El Paso, Tex..........	W.	W.	W.	W.	W.	W.	W.	E.	W.	W.	W.	W.
Apache, Fort, Ariz..	NE.	SW.	NE.	SW.	E.	E.	E.	E.	E.	NE.	NE.	NE.
Grant, Fort, Ariz....	NE.	N.	N.	NW.	NW.	N.	N.	E.	N.	N.	N.	N.
Prescott, Ariz	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.	SW.	S.
Thomas, Camp, Ariz.	SE.	NW.	W.	W.	W.	W.	NW.	SE.	SE.	SE.	SE.	SE.
Yuma, Ariz..........	N.	N.	W.	W.	W.	SW.	SE.	SE.	SW.	NE.	N.	N.
Middle Plateau:												
Winnemucca, Nev...	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.
Salt Lake City, Utah.	SE.	SE.	SE.	NW.	NW.	NW.	NW.	SE.	NW.	NW.	NW.	NW.
Northern Plateau........												
Boisé City, Idaho....	SE.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Lewiston, Idaho	E.	E.	E.	W.	W.	NE.	NE.	NE.	NE.	NE.	E.	E.
Dayton, Wash.......	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Spokane Falls, Wash.	NE. SW	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	SW.
North Pacific Coast:												
Canby, Fort, Wash ..	E.	N.	W.	W.	W.	W.	W.	W.	S.	S.	S.	SE.
Olympia, Wash.......	S.	S.	S.	S.	S.	N. SW.	N.	N.	S.	S.	S.	S.
Tatoosh Island, Wash	E.	E.	E.	E.	SW. W.	SW.	SW.	SW.	E.	E.	E.	E.
Portland, Oreg.......	S.	S.	S.	S.	NW.	NW.	NW.	NW.	NW.	S.	S.	S.
Roseburg, Oreg.......	SW.	NW.	SW.	NW.	NW.	N.	N.	N.	NW.	NW.	SW.	SW.
Middle Pacific Coast:												
Cape Mendocino, Cal.	NW.	NW.	SE.	NW.	NW.	NW.	NW.	N.	N.	N.	SE.	NW.
Red Bluff, Cal	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Sacramento, Cal.......	SE.	SE.	S.	S.	SW.	S.	S.	S.	S.	S.	N.	SE.
San Francisco, Cal...	N.	W.	W.	W.	W.	SW.	SW.	SW.	SW.	SW.	NW.	N.
South Pacific Coast:												
Los Angeles, Cal	NE.	NE.	W.	W.	W.	W.	W.	W.	W.	W.	NE.	NE.
San Diego, Cal.......	NE.	NW.	W.	W.	W.	W.	W.	W.	NW.	NW.	NW.	NE.
Alaska Stations:												
Saint Michael's, Fort, Alaska	NE.	NE.	NE.	NE.	N.	N.	S.	S.	N.	NE.	NE.	NE.
Sitka, Alaska........	E.	E.	E.	E.	E.	SW.	W.	SW.	E.	E.	E.	E.
Unalashka, Alaska..	SE.	SE.	SE.	SE.	SW.	SE.	SW.	SW.	SW.	SW.	SW.	SE.

APPENDIX 52.

Meteorological summary for the year ending December 31, 1884.

ALBANY, N. Y.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 42° 39′ N.; longitude, 73° 45′ W. Elevation of barometer above sea-level, 83 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 100 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.058	30.003	30.029	30.030	30.819	27	28.991	9	1.828	19.3	27.3	23.6	23.6	50.0	31	— 4.0	26	54.0	31.1	14.8	2.98	1.00	2	20	S.	30 31	S.	4,610
Feb	29.993	29.968	30.024	29.995	30.662	16	29.144	28	1.518	31.6	35.3	32.1	33.0	50.6	14	8.6	29	42.0	38.9	25.6	3.85	0.77	17, 18	26	NW., W.	20 28	S.	4,460
Mar	29.961	29.913	29.946	29.941	30.310	18	29.487	26	.873	32.4	39.8	35.2	35.8	55.7	25	10.0	1 8	45.7	41.6	30.1	4.00	0.89	7, 8	34	NW.	20	W.	4,586
Apr	29.794	29.732	29.781	29.769	30.185	21	29.132	8	1.003	43.9	53.1	46.4	47.8	71.2	27	30.0	1	41.2	54.2	40.3	2.09	0.94	2, 3	26	W.	3	N.	4,807
May	29.867	29.811	29.860	29.846	30.174	31	29.486	10	.688	55.2	65.4	56.7	59.1	85.2	23	38.8	30	46.4	66.9	50.8	2.79	0.68	15, 16	26	NW.	2	W.	4,409
June	30.035	29.956	29.981	29.991	30.467	15	29.617	9	.850	68.1	80.1	69.2	72.5	91.5	21	50.7	1	40.8	81.3	61.3	1.80	0.54	25, 26	17	S.	28	S.	3,759
July	29.788	29.718	29.755	29.754	29.947	4	29.495	13	.452	67.6	76.7	67.8	70.7	89.0	2 3	57.8	15 22	31.2	78.7	63.1	5.04	1.07	8, 9	20	S.	5 28 31	W.	4,226
Aug	29.984	29.913	29.951	29.949	30.234	25	29.557	30	.677	68.1	79.4	70.3	72.6	92.0	18 19	50.2	25	41.8	80.7	63.9	5.27	2.20	29	20	S.	4	S.	3,419
Sept	30.027	29.950	29.994	29.990	30.433	14	29.597	17	.836	62.8	74.2	65.4	67.5	90.1	10	42.3	14	47.8	75.2	58.7	1.80	0.51	11	22	S.	27	S.	3,759
Oct	30.063	29.994	30.036	30.031	30.537	26	29.556	8	.981	47.1	57.4	49.5	51.3	80.1	4	26.6	26	53.5	60.2	42.4	2.64	0.81	29, 30	28	SW.	22	SW.	5,004
Nov	29.993	29.952	20.962	29.969	30.378	3	29.362	23	1.016	34.5	43.4	37.4	38.4	68.0	23	20.0	19	48.0	46.6	31.7	3.44	1.25	23, 24	32	S.	28	SW.	5,097
Dec	30.098	30.046	30.055	30.066	30.725	27	29.379	7	1.349	25.0	30.8	27.5	27.8	57.9	7	−15.9	20	73.8	35.2	20.5	3.20	1.32	6, 7	32	SW.	7	N.	4,841
Sums	359.664	358.956	359.374	359.831	....	...	....	...	12.071	556.1	662.9	581.1	600.1	....	....	......	...	566.2	690.6	503.2	38.90	...	......	...	....	....	....	53,577
Means	29.972	29.913	29.948	29.944	30.819	†27	28.991	†9	1.006	46.3	55.2	48.4	50.0	92.0	‡18 19	−15.9	§20	47.2	57.6	41.9	.....	...	......	...	....	....	S.	......

† January. ‡ August. § December.

ALBANY, N. Y.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	21	18	2	0	26	9	12	10	0	9.3	12.9	13.4	11.9	64.2	54.3	65.1	61.2	7.5	7.3	6.1	7.0	2	14	15	12	14	30	0	0	0
Feb	16	3	2	3	21	6	14	15	7	23.7	22.1	23.6	23.1	72.5	59.1	70.5	67.4	8.3	8.8	7.2	8.1	1	9	10	20	4	21	0	0	0
Mar	19	8	3	0	17	5	21	20	0	23.8	25.7	27.0	25.5	70.6	57.9	72.0	66.8	7.0	6.7	5.4	6.4	5	14	12	17	6	17	0	0	0
Apr	24	8	3	2	12	2	16	23	0	33.6	33.5	35.8	34.3	67.5	49.8	67.3	61.5	7.0	6.2	5.9	6.4	6	11	13	9	0	1	0	0	0
May	8	3	3	3	29	4	30	12	1	44.6	44.0	45.3	44.6	68.3	47.7	66.4	60.8	6.8	7.1	4.6	6.2	6	15	10	15	0	0	0	2	0
June	26	2	3	1	41	0	14	2	1	55.9	54.9	56.8	55.9	65.7	44.1	66.1	58.6	3.5	4.1	3.1	3.6	15	9	6	9	0	0	1	4	0
July	11	0	2	2	26	2	38	12	0	57.5	57.1	57.7	57.4	70.6	52.4	70.9	64.6	7.5	7.0	5.0	6.5	2	18	11	16	0	0	0	8	0
Aug	16	3	0	3	42	4	13	10	2	60.1	59.9	60.5	60.2	75.9	53.2	71.5	66.9	5.2	6.4	4.2	5.3	10	13	8	9	0	0	3	4	0
Sept	9	5	6	0	42	4	12	9	3	54.9	56.0	56.1	55.7	75.7	54.3	72.7	67.6	4.1	5.5	3.0	4.2	11	15	14	9	0	0	1	4	0
Oct	25	6	2	0	10	30	2	17	1	37.7	37.4	38.6	37.9	70.9	49.4	66.8	62.4	6.1	6.2	5.5	5.9	6	12	13	11	0	2	0	2	2
Nov	21	4	4	0	11	29	4	16	1	25.3	24.8	27.9	26.0	69.6	49.5	68.9	62.7	5.6	7.4	6.6	6.5	6	9	15	11	1	16	0	0	0
Dec	21	17	2	0	10	20	3	19	1	18.5	20.4	20.8	19.9	76.1	66.0	76.0	72.7	6.5	7.5	7.4	7.1	2	14	15	14	9	24	0	0	0
Sums	217	72	32	14	287	115	179	165	17	444.9	448.7	463.5	452.4	847.6	637.7	834.2	773.2	75.1	80.2	64.0	73.2	72	153	141	152	34	111	5	24	2
	Percentages.																					Percentages.								
Means	19.8	6.6	2.9	1.3	26.1	10.5	16.3	15.0	1.5	37.1	37.4	38.6	37.7	70.6	53.1	69.5	64.4	6.3	6.7	5.3	6.1	19.7	41.8	38.5	41.5	9.3	30.3	1.4	6.0	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.13 a. m., 3.13 p. m., and 11.13 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.019 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.100; March, 0.100; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November 0.090; December, 0.100.

J. O. BARNES,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ALPENA, MICH.

Location of office on December 31, 1884, Fletcher and Dock streets.

[Latitude, 45° 5′ N.; longitude, 83° 39′ W. Elevation of barometer above sea-level, 609 feet. Elevation of exposed thermometer above ground, 55 feet. Elevation of rain-gauge above ground, 52 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.369	29.333	29.374	29.359	30.037	26	28.579	2	1.458	10.0	16.7	11.3	12.7	40.5	30	—20	25	60.5	20.3	5.0	3.07	1.00	2	28	W.	8	W.	7,474
Feb	29.356	29.333	29.351	29.347	29.904	10	28.684	19	1.220	12.0	19.5	14.0	15.2	38.0	19	—17	29	55.0	22.6	7.2	2.78	0.51	4, 5	38	W.	20	W.	6,738
Mar	29.363	29.337	29.354	29.351	29.781	30	28.648	11	1.133	17.7	29.1	22.8	23.2	54.0	21	—19	2	73.0	32.3	14.8	1.61	0.87	25, 26	33	SW.	12	NW.	6,460
Apr	29.318	29.285	29.296	29.300	29.935	21	28.539	15	1.396	33.9	42.5	35.6	37.3	65.0	25	20.5	6	44.5	45.4	30.5	0.75	0.61	15, 16	35	SE.	27	NW.	7,505
May	29.260	29.249	29.264	29.258	29.686	28	28.857	19	.829	45.3	53.0	47.2	48.5	80.3	23	30.2	3	50.1	57.8	40.7	3.27	0.87	4, 5	34	W.	15	SE.	6,765
June	29.442	29.412	29.405	29.420	29.811	14	29.085	24	.726	60.5	64.7	59.3	61.5	85.0	30	40.0	11	45.0	70.9	52.9	2.67	1.10	23, 24	23	SE., E.	7 18	SE.	4,562
July	29.222	29.200	29.221	29.214	29.475	8	28.842	5	.633	58.2	67.2	58.4	61.3	83.0	1	45.0	9 14 17	38.0	70.8	52.9	2.38	0.85	30, 31	30	W.	5	W.	5,959
Aug	29.327	29.304	29.319	29.317	29.715	9	28.894	30	.821	58.1	68.0	60.0	62.0	91.2	20	39.0	9	52.2	70.4	53.3	2.69	1.38	29, 30	24	SE., W.	2 21 23 30	W.	5,975
Sept	29.331	29.293	29.323	29.316	29.859	13	28.704	24	1.155	55.9	67.4	58.3	60.5	93.0	9	35.0	23	58.0	70.6	51.6	4.83	2.36	28	48	W.	10	W.	6,291
Oct	29.389	29.347	29.368	29.368	29.886	14	29.021	5	.865	45.0	53.9	45.9	48.3	84.0	8	20.9	24	63.1	56.5	40.0	3.75	1.06	3	35	E.	2	W.	7,769
Nov	29.313	29.278	29.316	29.302	29.655	18	28.486	23	1.169	29.3	35.4	30.4	31.7	58.0	14	10.1	24	47.9	38.8	26.2	2.15	1.11	22, 23	32	W.	23	W.	6,981
Dec	29.323	29.314	29.345	29.327	29.926	25	28.583	6	1.343	22.0	26.0	21.6	23.2	50.1	31	—10.0	19	60.1	29.4	16.4	5.58	1.56	6	29	SW.	31	W.	6,102
Sums ..	352.013	351.685	351.936	351,879	......	...	......	...	12.748	447.9	543.4	464.8	485.4	....	....	......	...	647.4	585.8	391.5	35.53	....	......	...	....	....	....	78,581
Means .	29.334	29.307	29.328	29.323	30.037	‡26	28.486	*23	1.062	37.3	45.3	38.7	40.4	93.0	†9	—20.0	‡25	54.0	48.8	32.6	....	....	......	...	....	....	W.	......

* November. † September. ‡ January.

ALPENA, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.												Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1884.										°	°	°	°																	
Jan	5	5	0	6	6	19	34	15	3	3.6	8.9	4.2	5.6	75.3	71.3	72.9	73.2	7.7	7.3	6.8	7.3	1	13	17	17	26	31	0	0	0
Feb	6	6	12	13	11	1	21	16	1	6.9	11.8	8.1	8.9	79.1	71.7	77.0	75.9	7.5	6.8	6.4	6.9	3	10	16	22	26	29	0	0	1
Mar	8	4	8	20	3	7	13	25	5	12.4	18.9	16.2	15.8	78.9	66.3	75.6	73.6	4.9	5.5	4.7	5.0	8	15	8	11	11	29	0	0	3
Apr	6	4	14	18	0	1	13	32	2	26.3	26.0	26.6	26.3	74.2	55.6	71.1	67.0	5.2	3.7	4.0	4.3	10	14	6	5	0	20	0	1	3
May	6	10	12	24	1	4	20	11	5	38.6	38.2	39.3	38.7	78.2	61.3	76.1	71.9	4.8	5.8	4.1	4.9	9	15	7	15	0	1	0	2	0
June	5	4	16	26	7	5	16	5	6	52.7	52.1	52.6	52.5	76.3	65.6	79.3	73.7	2.7	4.3	3.3	3.4	14	11	5	11	0	0	0	6	0
July	3	4	7	17	7	5	29	17	4	52.2	51.3	51.6	51.7	80.7	59.7	78.5	73.0	5.7	5.9	4.0	5.2	6	16	9	15	0	0	0	6	3
Aug	1	4	3	22	14	8	23	15	3	52.9	53.4	53.5	53.3	83.3	61.9	80.1	75.1	3.6	4.9	2.6	3.7	15	12	4	13	0	0	1	4	0
Sept	3	1	4	17	12	12	28	10	3	51.0	50.9	51.2	51.0	84.2	59.0	78.3	73.8	4.5	4.2	3.4	4.0	13	12	5	16	0	0	1	4	2
Oct	2	2	5	8	11	15	29	18	3	40.2	39.0	39.2	39.5	84.0	60.9	79.4	74.8	6.5	5.8	5.0	5.8	7	13	11	16	0	3	0	1	2
Nov	3	0	5	6	10	14	43	9	0	25.9	29.3	26.9	27.4	87.2	79.0	87.1	84.4	7.0	6.0	5.4	6.1	3	15	12	11	8	21	0	0	0
Dec	3	3	6	5	12	10	44	5	5	18.4	20.9	17.8	19.0	86.0	80.8	85.3	84.0	7.6	7.5	7.1	7.4	1	15	15	19	16	27	0	0	1
Sums	51	47	92	182	94	101	313	178	40	381.1	400.7	387.2	389.7	967.4	793.1	940.7	900.4	67.7	67.7	56.8	64.0	90	161	115	171	87	161	2	24	15
	Percentages.																					Percentages.								
Means	4.6	4.3	8.4	16.6	8.6	9.2	28.5	16.2	3.6	31.8	33.4	32.3	32.5	80.6	66.1	78.4	75.0	5.6	5.6	4.7	5.3	24.6	44.0	31.4	46.7	23.8	44.0	0.5	6.6	4.1

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.34 a. m, 2.34 p. m., and 10.34 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.660; June, 0.650; July, 0.640; August, 0.640; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—September 19, about 2.40 p. m., a slight earthquake shock was felt in the western part of this city. Shock lasted about 2 seconds. Vibration, SW. to NW.

JAMES J. FITZGERALD,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

APACHE, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 33° 48′ N.; longitude, 109° 57′ W. Elevation of barometer above sea-level, 5,050 (B.) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 8 consecutive 8 hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	25.071	25.040	25.066	25.059	25.309	1	24.840	9	.469	25.2	46.0	33.5	34.9	59.8	8	6.0	2	53.8	51.1	21.0	0.68	0.39	17	36	NE.	10	E. NE. SW.	4,053
Feb	24.979	24.955	24.987	24.974	25.241	22	24.575	6	.666	31.9	49.2	39.6	40.2	69.2	24	8.2	14	61.0	52.9	28.3	3.43	1.11	3, 4	40	SW.	6	SW.	5,016
Mar	24.927	24.910	24.932	24.923	25.105	18	24.663	23	.442	33.8	52.9	41.7	42.8	66.2	14	15.3	24	50.9	56.4	31.3	4.44	1.84	4	38	W.	10	SW.	5,836
Apr	24.927	24.910	24.924	24.920	25.083	24	24.719	27	.364	35.0	60.9	46.6	47.5	77.0	9	24.8	2	52.2	64.9	32.9	1.67	0.66	17	36	SW.	10	SW.	5,803
May	24.973	24.958	24.964	24.965	25.147	9	24.820	21	.327	41.6	69.7	55.4	55.6	85.8	9	31.0	2	54.8	75.3	39.5	1.31	0.90	18, 19	27	SW.	18 20	E.	5,096
June	25.007	24.982	24.994	24.994	25.137	28	24.877	6	.260	47.7	80.5	63.6	63.9	95.3	25	38.1	1 15	57.2	85.6	45.7	2.85	1.60	14	28	SW. S. NE.	10 14 30	E.	4,815
July	25.058	25.030	25.038	25.042	25.099	10	24.940	4	.159	58.5	89.0	74.2	73.9	102.0	5, 27	47.0	19	55.0	94.5	55.8	0.14	0.08	10	32	SE.	20	E.	4,719
Aug	25.079	25.060	25.076	25.072	25.172	4	24.943	18	.229	56.6	80.4	66.6	67.9	97.1	4	42.5	21	54.6	85.1	53.9	5.59	1.76	22, 23	32	NW.	6	E.	3,819
Sept	25.047	25.020	25.036	25.034	25.202	20	24.799	30	.403	48.8	75.5	58.6	61.0	88.0	20	33.0	28	55.0	80.0	45.7	1.50	1.20	14	26	SW.	26	SW.	4,202
Oct	25.065	25.038	25.064	25.056	25.283	16	24.716	1	.567	46.9	69.1	54.6	56.9	85.8	5	27.0	28	58.8	72.5	43.9	2.02	0.71	24	26	S.	18	NE.	4,813
Nov	25.114	25.077	25.117	25.103	25.288	30	24.803	21	.485	31.2	60.1	41.1	44.1	73.5	1	16.7	19	56.8	63.5	27.7	0.82	0.43	8, 9	24	NE.	29	E.	3,295
Dec	24.988	24.956	24.994	24.979	25.304	1	24.611	27	.693	25.0	43.6	33.1	33.9	63.6	2	— 8.0	15	71.6	47.8	21.9	5.52	1.33	27	33	NE.	4	NE.	3,684
Sums..	300.235	299.936	300.192	300.121	....	...	....	...	5.064	482.2	776.9	608.6	622.6	....	...	......	..	680.7	829.1	447.6	29.47	....	......	...	....	....	....	54,151
Means	25.020	24.995	25.016	25.010	25.309	*1	24.575	†6	.422	40.2	64.7	50.7	51.9	102.0	‡5,27	— 8.0	§15	56.7	69.1	37.3	.....	....	......	...	....	....	E.	......

* January. † February. ‡ July. § December.

APACHE, FORT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	2	23	23	15	3	28	3	1	0	19.1	27.3	24.6	23.7	77.2	50.5	70.0	65.9	3.6	4.9	2.7	3.7	14	12	5	4	0	28	0	0	0
Feb	3	19	8	7	5	33	3	4	0	26.7	32.4	31.1	30.1	80.8	56.9	72.7	70.1	4.8	5.5	4.8	5.0	14	4	11	12	0	10	0	0	0
Mar	1	13	18	10	1	32	15	3	0	29.1	36.1	34.3	33.2	82.4	56.8	76.1	71.8	5.0	6.1	4.2	5.1	9	12	10	14	0	17	0	1	0
Apr	0	19	25	5	3	26	7	5	0	29.7	30.8	31.6	30.7	81.3	34.0	57.8	57.7	3.7	5.5	2.5	3.9	13	12	5	7	0	11	0	0	0
May	1	15	35	3	2	30	6	0	1	34.1	35.7	38.1	36.0	76.2	33.1	54.7	54.7	2.3	3.3	1.7	2.4	21	8	2	6	0	3	0	2	0
June	0	11	31	5	5	27	8	2	1	39.8	41.1	43.6	41.5	74.8	26.7	50.5	50.7	2.4	3.3	2.4	2.7	19	9	2	6	0	0	6	7	0
July	0	12	34	10	4	18	10	5	0	48.3	44.6	48.2	47.0	69.9	22.7	42.1	44.9	2.5	3.5	2.7	2.9	19	11	1	4	0	0	26	4	0
Aug	4	15	24	12	6	22	6	4	0	50.5	50.3	54.5	51.8	81.1	38.4	68.1	62.5	4.9	6.1	4.0	5.0	7	20	4	17	0	0	6	16	0
Sept	3	18	20	9	7	21	10	2	0	44.3	46.8	48.2	46.4	84.9	39.2	69.6	64.6	2.6	3.7	2.3	2.9	18	9	3	9	0	0	0	7	0
Oct	2	23	17	15	6	20	7	2	1	42.2	42.6	44.1	43.0	84.4	40.7	68.9	64.7	2.8	4.6	2.6	3.3	17	9	5	7	0	5	0	1	0
Nov	2	24	27	6	6	18	3	1	3	27.5	31.1	29.8	29.5	86.4	36.2	63.7	62.1	1.1	3.0	1.1	1.7	22	7	1	4	0	23	0	2	0
Dec	3	27	16	10	5	19	8	0	5	21.8	29.5	25.7	25.7	87.4	62.1	76.1	75.2	4.2	5.0	3.9	4.4	14	7	10	10	3	24	0	0	0
Sums	21	219	278	107	53	294	86	29	11	413.1	448.3	453.8	438.6	966.8	497.3	770.8	744.9	39.9	54.5	34.9	43.0	187	120	59	100	3	130	38	40	0
	Percentages.																					Percentages.								
Means	1.9	19.9	25.3	9.7	4.8	26.8	7.8	2.6	1.0	34.4	37.4	37.8	36.5	80.6	41.4	64.2	62.1	3.3	4.5	2.9	3.6	51.1	32.8	16.1	27.3	0.8	35.5	10.4	10.9	0.0

NOTE —7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 4.48 a. m., January 1, to 8.48 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.120; February, 5.100; March, 5.020; April, 4.920; May, 4.820; June, 4.750; July, 4.740; August, 4.720; September, 4.800; October, 4.900; November, 5.100; December, 5.080.

W. S. MAYERS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ASSINABOINE, FORT, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 48° 32′ N.; longitude, 109° 42′ W. Elevation of barometer above sea-level, 2,720 (B.) feet. Elevation of exposed thermometer above ground, 14 feet. Elevation of rain-gauge above ground, 4 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	27.220	27.224	27.208	27.217	27.687	4	26.745	31	.942	9.9	15.8	13.7	13.1	42.0	12	—30.0	4	72.0	22.0	1.8	.16	.04	5	48	SW.	12	SW.	8,836
Feb	27.188	27.198	27.191	27.192	27.677	26	26.437	17	1.240	0.5	5.6	3.8	3.3	41.8	24	—35.0	11	76.8	12.2	—6.2	.44	.17	16, 17	48	SW.	24	SW.	7,067
Mar	27.081	27.082	27.077	27.080	27.381	6	26.614	10	.767	16.5	27.2	23.7	22.5	56.6	29	—25.8	7	82.4	36.4	11.2	.53	.17	10	40	NW.	10	SW.	6,148
Apr	27.151	27.138	27.143	27.144	27.599	18	26.683	12	.916	33.1	49.0	41.3	41.1	72.8	23	15.7	6	57.1	54.0	29.4	.25	.15	16, 27	32	NW., E., W.	9 25 12 24	SW.	6,438
May	27.144	27.126	27.116	27.129	27.448	29	26.706	3	.742	47.5	65.1	58.4	57.0	86.1	25	32.0	2, 4	54.1	71.1	42.8	3.05	1.06	28	38	W.	3	NW.	6,309
June	27.100	27.083	27.070	27.084	27.309	30	26.914	14	.395	57.6	72.0	66.3	65.3	98.6	19	46.5	16	52.1	78.0	53.8	4.72	1.17	13, 27–28	40	W., NW.	24 25	NW.	7,250
July	27.148	27.118	27.120	27.129	27.318	12	26.823	31	.495	54.7	71.3	65.7	63.9	89.0	6	43.0	5	46.0	76.9	52.9	9.67	3.27	16	53	SE.	19	NW.	7,830
Aug	27.176	27.158	27.149	27.161	27.405	22	26.820	1	.585	54.0	73.7	66.3	64.7	93.4	10	42.1	19	51.3	80.4	51.0	2.61	1.27	1	48	SE.	27	NW.	5,542
Sept ...	27.085	27.073	27.079	27.079	27.400	19	26.752	27	.648	43.8	56.6	50.3	50.2	77.2	1	25.0	30	52.2	61.5	40.6	2.69	.82	4, 5	50	NW.	3	NW.	6,722
Oct	27.116	27.099	27.124	27.113	27.610	21	26.761	1	.849	38.6	54.4	46.1	46.4	83.0	13	13.8	27	69.2	59.3	33.7	.41	.19	1, 2	60	SW.	13	W.	9,647
Nov	27.227	27.224	27.224	27.225	27.496	15	26.816	26	.680	31.1	44.0	37.6	37.6	68.1	6, 7	—12.8	23	80.9	48.1	23.7	.42	.29	20, 21	48	NW., SW.	26 28	SW.	9,357
Dec	27.226	27.215	27.231	27.224	27.630	9	26.731	3	.899	—0.1	7.2	3.4	3.5	63.8	1	—50.0	25	113.8	11.2	—7.9	.72	.13	13, 14	42	SW.	8, 9	SW.	8,440
Sums .	325.862	325.738	325.732	325.777	......	...	......	...	9.158	387.2	541.9	476.6	468.6	...	...	......	...	807.9	611.1	326.8	25.67	...	....	..	....	......	......	89,578
Means.	27.155	27.145	27.144	27.148	27.687	*4	26.437	†17	.763	32.3	45.2	39.7	39.1	98.6	‡19	—50.0	§25	67.3	50.9	27.2	.....	....	....	..	....	......	SW.	......

* January. † February. ‡ June. § December.

ASSINABOINE, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	6	11	0	0	43	5	15	8	3.6	9.4	6.8	6.6	76.0	75.7	74.2	75.3	4.2	4.1	3.7	4.0	10	19	2	7	19	29	0	0	0
Feb	4	10	24	2	4	25	2	9	7	—3.1	0.5	0.5	—0.7	85.9	80.2	86.7	84.3	3.8	4.6	3.4	3.9	9	17	3	14	22	28	0	0	0
Mar	2	5	11	1	3	22	18	14	17	12.4	20.6	17.8	16.9	84.7	78.1	80.5	81.1	3.6	5.1	2.8	3.8	15	12	4	5	8	30	0	0	1
Apr	1	14	12	7	3	17	8	12	16	27.8	30.1	28.8	28.9	81.4	53.8	64.4	66.5	2.8	4.5	2.2	3.2	14	14	2	4	0	20	0	0	0
May	1	16	10	15	1	10	6	19	15	36.6	38.6	40.8	38.7	67.5	42.3	54.8	54.9	3.5	4.2	3.8	3.8	12	15	4	7	0	0	0	2	0
June	0	6	14	10	1	8	18	26	7	44.9	48.7	51.1	48.2	65.0	46.5	60.1	57.2	2.7	4.1	3.9	3.6	13	15	2	9	0	0	1	7	0
July	0	9	0	18	0	3	26	29	8	46.7	46.5	49.9	47.7	75.7	44.6	59.3	59.9	3.5	5.5	5.1	4.7	10	15	6	13	0	0	0	8	0
Aug	3	12	4	9	1	10	20	32	2	46.2	48.3	51.8	48.8	76.6	43.1	61.1	60.3	2.8	3.1	2.6	2.8	17	12	2	9	0	0	3	3	0
Sept	3	3	18	3	2	9	13	24	15	34.2	33.8	37.4	35.1	70.9	46.4	63.7	60.3	4.7	5.9	5.4	5.3	7	15	8	14	0	2	0	1	0
Oct	3	5	13	7	5	16	26	17	1	25.4	24.2	25.9	25.2	60.9	35.5	49.4	48.6	4.2	5.0	3.9	4.4	12	12	7	7	0	12	0	0	0
Nov	0	8	9	3	4	41	16	8	1	22.0	26.0	22.2	23.4	69.9	53.0	56.5	59.8	3.2	4.1	3.2	3.5	14	11	5	3	4	24	0	0	0
Dec	0	5	11	0	1	44	12	14	6	—10.1	—5.7	—8.1	—8.0	63.7	60.1	63.2	62.3	4.3	4.9	6.2	5.1	9	15	7	13	21	28	0	0	0
Sums	27	99	137	75	25	248	170	219	98	286.6	321.0	324.9	310.8	878.2	659.3	773.9	770.5	43.3	55.1	46.2	48.1	142	172	52	105	74	173	4	21	1
	Percentages.																					Percentages.								
Means	2.5	9.0	12.5	6.8	2.3	22.6	15.5	19.9	8.9	23.9	26.8	27.1	25.9	73.2	54.9	64.5	64.2	3.6	4.6	3.8	4.0	38.8	47.0	14.2	28.7	20.2	47.2	1.1	5.7	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.49 a. m., 12.40 p. m., and 8.49 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.018.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.05; February, 3.05; March, 3.02; April, 2.91; May, 2.85; June, 2.80; July, 2.74; August, 2.76; September, 2.86; October, 2.93; November, 2.99; December, 3.04.

REMARKS.—March. Lunar halos, 8, 9; polar bands, 10; aurora, 28. April. Last frost of season, 18; last snowfall, 27. May. Thunder-storms, 16, 27, influencing telegraph line. June. Thunder-storms, 4, 5, 10, 11, 13, 27, 28; hailstones an inch in diameter fell on the 13, 28. July. Thunder-storms, 7, 11, 15, 19, 24, 26, 27, 29; hailstones half an inch in diameter, 7; heavy monthly rainfall. August. Thunder-storms, 14, 21, 26; rapid changes of temperature, 26. September. First frost of season, 7; mock sun, 7; thunder-storm, 14. October. First snowfall, 3; unusually high temperature, highest wind velocity ever observed at this station, 13; extensive prairie fires, 12, 13; hot withering winds. November. High temperature; prairie fire, 7. December. Mercury frozen, 22, 24, 25.

J. J. O'CONNOR,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ATLANTA, GA.

Location of office on December 31, 1884, United States custom-house, corner Marietta and Forsyth streets.

[Latitude, 33° 45′ N.; longitude, 84° 23′ W. Elevation of barometer above sea-level, 1,129 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 74 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.026	28.996	29.027	29.016	29.436	27	28.522	8	.914	30.9	41.3	34.9	35.7	64.0	31	—1.3	6	65.3	44.3	26.8	5.20	1.87	18	32	SE.	7	NW.	8,745
Feb	28.945	28.908	28.927	28.927	29.240	16	28.444	27	.796	45.3	56.7	50.9	51.0	73.0	10	11.0	29	62.0	60.3	43.1	5.84	2.41	16, 17	36	NW.	20 27	NW.	7,711
Mar	28.889	28.865	28.887	28.880	29.223	16	28.485	1	.738	48.9	59.9	53.8	54.2	76.5	28	24.5	1	52.0	62.8	46.4	9.70	2.14	18, 19	44	N.	1	NW.	8,544
Apr	28.813	28.780	28.807	28.800	29.041	29	28.467	2	.574	52.5	64.3	57.5	58.1	82.3	30	35.0	9	47.3	66.5	50.2	5.86	3.76	14, 15	43	W.	2	NW.	7,356
May	28.868	28.826	28.849	28.848	29.070	3	28.637	27	.433	64.6	77.6	70.4	70.9	85.0	22 23	55.0	31	30.0	79.1	62.3	1.33	.42	14	22 22 22	SW. W. NE.	1 6 29	NW.	6,242
June	28.896	28.857	28.877	28.877	29.131	16	28.574	10	.557	66.8	75.3	70.3	70.8	89.0	20	57.0	1	32.0	78.1	64.0	10.73	1.50	14, 15	31	S.	9	E.	6,038
July	28.852	28.811	28.835	28.833	29.008	23	28.661	10	.347	73.0	83.3	77.8	78.0	90.4	24	65.4	7	25.0	85.1	70.9	2.42	.85	1	37	N.	6	W.	5,486
Aug	28.941	28.892	28.924	28.919	29.069	20	28.714	30	.355	69.4	81.3	74.5	75.1	89.0	27	60.0	6	29.0	83.1	67.5	2.06	.86	9, 10	35	N.	8	E.	4,989
Sept	28.987	28.928	28.967	28.961	29.177	15	28.791	1	.386	67.3	82.7	74.8	74.9	87.5	8 12	52.2	15	35.3	83.6	66.0	.08	.05	12	28	E.	14	SE.	5,672
Oct	29.025	28.967	28.997	28.996	29.296	20	28.775	8	.521	60.5	75.9	67.0	67.8	90.8	8	33.6	24	57.2	77.1	58.9	.70	.39	22	24 24	NW. SE.	28 27	E.	6,442
Nov	28.974	28.926	28.965	28.955	29.249	7	28.341	28	.908	44.5	59.4	50.9	51.6	70.0	2	30.4	25	39.6	60.6	42.0	2.84	.98	18, 19	32	W.	28	NW.	6,289
Dec	28.989	28.947	28.986	28.974	29.293	27	28.512	6	.781	40.3	50.8	44.6	45.1	66.5	22	11.0	19	55.5	52.5	36.7	6.00	3.74	14	30	NW.	18	E.	8,192
Sums	347.205	346.703	347.048	346.986	....	...	....	...	7.810	664.0	808.0	727.4	738.2	....	....	....	...	530.2	833.1	634.8	52.85	....	......	...	....	....	....	81,656
Means	28.934	28.892	28.921	28.916	29.436	*27	28.341	†28	.609	55.3	67.3	60.6	61.1	90.8	‡8	—1.3	*6	44.2	69.4	52.9	.....	....	......	...	....	....	NW.	......

* January. † November. ‡ October.

ATLANTA, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	6	1	9	10	6	9	15	37	0	25.6	26.7	26.9	26.4	81.2	58.6	73.0	70.9	5.4	5.8	5.8	5.7	8	11	12	15	4	18	0	1	0
Feb	4	1	5	10	16	19	10	22	0	36.5	37.9	38.2	37.5	72.0	53.1	61.0	63.0	4.2	3.9	3.6	3.9	14	10	5	14	0	5	0	5	0
Mar	5	2	3	16	11	17	16	23	0	40.8	41.7	41.2	41.2	75.2	56.1	66.2	65.8	5.7	5.5	4.4	5.2	11	10	10	16	0	4	0	5	0
Apr	4	1	9	13	2	11	17	33	0	42.4	40.1	42.8	41.8	70.4	46.7	60.9	59.3	4.6	5.1	4.5	4.7	12	8	10	13	0	0	0	4	0
May	2	1	12	10	6	7	26	29	0	55.0	53.5	53.6	54.7	71.7	45.9	60.6	59.4	4.2	4.9	2.9	4.0	13	14	4	8	0	0	0	4	0
June	2	11	29	23	6	5	10	4	0	61.2	61.0	62.2	61.5	83.1	65.0	77.4	75.2	6.6	7.3	6.1	6.7	6	8	16	21	0	0	0	9	0
July	7	5	2	2	5	27	32	13	0	67.0	65.7	68.3	67.0	82.7	57.1	73.8	71.2	4.1	5.2	2.6	4.0	14	11	6	9	0	0	1	9	0
Aug	4	19	21	11	4	4	11	18	1	64.6	63.0	65.0	64.2	84.8	55.2	73.1	71.0	3.2	5.1	3.0	3.8	9	19	3	10	0	0	0	6	0
Sept	8	14	19	25	13	3	4	9	0	60.1	57.6	60.2	59.3	78.3	43.7	61.2	61.1	2.0	3.7	1.5	2.4	19	11	0	3	0	0	0	0	0
Oct	5	7	27	15	5	1	12	21	0	52.9	54.2	53.5	53.5	76.7	49.5	63.0	63.1	2.6	3.7	1.6	2.6	21	7	3	4	0	0	2	1	0
Nov	9	3	15	6	3	5	18	31	0	35.4	34.6	35.5	35.2	71.1	42.9	57.6	57.2	3.7	3.6	3.0	3.4	16	9	5	9	0	2	0	0	0
Dec	2	2	29	11	5	8	9	27	0	34.5	36.4	36.8	35.9	80.7	61.7	75.9	73.1	5.2	6.4	5.2	5.6	6	16	9	12	1	8	0	1	0
Sums	58	67	180	152	82	116	180	267	1	576.0	572.4	586.2	578.2	927.9	636.5	806.7	790.3	51.5	60.2	44.2	52.0	149	134	83	134	5	37	3	45	0
	Percentages.																					Percentages.								
Means	4.8	6.1	16.4	18.8	7.5	10.6	16.4	24.8	0.1	48.0	47.7	48.8	48.2	77.3	53.0	67.2	65.8	4.3	5.0	3.7	4.3	40.7	36.6	22.7	36.6	1.4	10.1	0.8	12.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.31 a. m., 2.31 p. m., and 10.31 p. m., local time.

Correction for instrumental error of barometer used: From 6.31 a. m., January 1, to 10.31 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.230; February, 1.220; March, 1.210; April, 1.190; May, 1.170; June, 1.150; July, 1.150; August, 1.150; September, 1.170; October, 1.190; November, 1.220; December, 1.230.

REMARKS.—The lowest temperature, −1°.3, occurred January 6. Very destructive cyclone crossed the State February 19. Highest wind, 44 miles, on March 1. Damaging rain with hail April 14 and 15. Last frost of the season April 11. Greatest monthly rainfall in June, 10.73 inches. Severe drought in August, September, and October—73 days after August 9 without rain. Highest temperature, 90°.8, October 3. First light frost October 24. First killing frost November 6. Greatest daily rainfall, 3.74 inches, December 14. Heavy sleet December 21.

S. W. BEALL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ATLANTIC CITY, N. J.

Location of office on December 31, 1884, No. 10 Rhode Island avenue.

[Latitude, 39° 22′ N.; longitude, 74° 25′ W. Elevation of barometer above sea-level, 13 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-guage above ground, 87 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.113	30.091	30.105	30.103	30.809	27	29.167	9	1.642	26.9	32.0	28.7	29.2	50.0	14	4.0	6, 7	46.0	35.8	21.7	7.17	1.51	8, 9	36	SE.	8	SW.	7,362
Feb	30.089	30.032	30.070	30.047	30.707	16	29.163	28	1.542	36.5	39.8	36.5	37.6	54.6	14	11.0	29	43.6	43.1	31.2	7.44	1.29	28	31	NW.	20	E.	6,659
Mar	30.016	29.955	30.006	29.992	30.447	16	29.474	26	.973	36.3	41.8	37.8	38.6	60.2	28	8.0	1, 4	52.2	45.0	32.4	5.79	1.79	14, 15	32	E. NE. SE. N.	9 14 19 30	NW.	6,419
Apr	29.844	29.803	29.842	29.830	30.184	12	29.117	2	1.067	44.9	51.2	44.9	47.0	67.0	29	29.5	7	37.5	54.2	40.0	4.29	1.30	2	28	NW.	3	NW.	6,096
May	29.944	29.912	29.942	29.933	30.299	31	29.582	11	.717	56.9	63.3	55.9	58.7	78.1	5	41.0	29	37.1	66.7	51.5	1.62	1.02	28	24	NE.	7	SW.	6,197
June	30.066	30.053	30.046	30.055	30.467	15	29.734	9	.733	65.6	69.9	63.8	66.4	87.2	3	49.0	1	38.2	72.4	59.8	3.60	1.34	11, 12	52	NE.	26	NE. SE. E.	6,552
July	29.869	29.825	29.843	29.846	30.008	22	29.585	13	.423	68.5	75.1	68.2	70.6	89.9	24	56.9	21	33.0	77.9	68.8	4.73	2.21	29	24	E.	29	SW.	5,226
Aug	30.041	30.013	30.027	30.027	30.299	25	29.710	30	.589	69.7	75.0	69.8	71.5	88.6	20	61.1	8	27.5	77.3	65.9	4.04	1.47	5	27	S.	29	NE.	5,808
Sept	30.112	30.072	30.090	30.091	30.443	14	29.718	17	.725	66.8	74.6	67.8	69.7	86.2	29	49.7	14	36.5	76.0	63.8	.34	.18	12	27	SW.	16	SW.	5,782
Oct	30.149	30.098	30.128	30.125	30.561	26	29.759	17	.802	55.7	63.8	56.6	58.5	83.0	4	32.4	26	50.6	65.8	50.8	2.94	1.39	22, 23	25	NE.	2	NW.	6,644
Nov	30.093	30.041	30.048	30.061	30.451	22	29.872	28	1.079	41.0	50.7	44.6	45.4	69.9	2	20.0	25	49.9	54.5	37.1	4.03	1.60	23, 24	42	S.	23	NW. SW.	5,558
Dec	30.178	30.113	30.130	30.139	30.613	20	29.576	6	1.037	35.0	40.4	37.2	37.5	61.0	7	2.1	20	58.9	44.4	31.5	7.71	2.11	21	32	E. NE.	12 15	NW.	6,977
Sums ..	360.459	360.008	360.277	360.249	......	...	....	...	11.329	603.8	677.1	611.8	630.7	....	....	......	...	511.0	713.1	549.0	53.70	....	......	...	....	....	....	75,232
Means .	30.038	30.001	30.023	30.021	30.809	*27	29.117	†2	.944	50.3	56.4	51.0	52.6	89.9	‡24	2.1	§20	42.6	59.4	45.8	.....	....	......	...	....	....	SW.	......

* January. † April. ‡ July. § December.

ATLANTIC CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	18	15	5	2	3	19	14	16	1	20.4	25.4	21.1	22.3	76.8	76.9	74.0	75.9	6.6	7.8	5.6	6.7	4	13	14	15	9	26	0	0	0
Feb	9	14	24	4	6	13	8	9	0	32.2	33.8	31.8	32.6	85.1	80.6	84.0	83.2	5.7	4.7	6.3	5.6	5	16	8	18	1	13	0	2	0
Mar	15	9	9	11	3	10	11	18	7	31.3	34.7	33.2	33.1	82.7	78.8	84.4	82.0	5.6	7.5	5.8	6.3	6	14	11	18	3	10	0	1	0
Apr	15	2	17	9	5	4	17	18	3	37.9	40.7	38.6	39.1	77.8	69.0	79.4	75.4	4.2	6.4	4.7	5.1	6	16	8	10	0	1	0	0	0
May	7	7	7	16	13	17	13	8	5	50.0	50.3	49.7	50.0	79.2	65.5	80.9	75.2	5.0	4.8	4.2	4.7	11	12	8	9	0	0	0	0	0
June	3	15	15	15	13	11	4	4	10	60.0	61.7	59.5	60.4	83.4	75.3	86.5	81.7	2.8	3.4	3.5	3.2	18	5	7	6	0	0	0	0	0
July	2	4	9	11	21	22	14	8	2	62.2	63.5	63.7	63.1	81.0	69.6	86.4	79.0	5.8	4.3	4.3	4.8	8	15	8	13	0	0	0	1	0
Aug	12	21	15	11	14	12	3	3	2	65.2	66.7	66.2	66.0	86.7	76.4	88.6	83.9	5.2	5.3	3.8	4.8	11	11	9	10	0	0	0	2	0
Sept	3	10	10	4	15	39	3	6	0	61.3	64.4	63.1	62.9	83.0	71.5	85.7	80.1	2.0	2.2	0.7	1.6	23	6	1	3	0	0	0	0	0
Oct	11	13	3	3	12	20	10	21	0	49.1	51.1	50.9	50.4	79.6	66.7	81.6	76.0	3.9	3.9	3.9	3.9	13	12	6	10	0	0	0	0	0
Nov	8	9	10	4	7	17	16	17	2	36.5	41.2	39.9	39.2	84.9	71.1	84.4	80.1	3.7	4.2	3.3	3.7	17	6	7	7	0	8	0	0	0
Dec	12	12	7	2	6	16	17	20	1	30.4	34.2	32.8	32.5	84.1	79.8	85.0	83.0	5.1	6.3	5.4	5.6	9	10	12	12	3	14	0	1	0
Sums	115	131	131	92	118	200	130	148	33	536.5	567.7	550.5	551.6	984.3	881.2	1000.9	955.5	55.6	60.8	51.5	56.0	131	136	99	131	16	72	0	7	0
	Percentages.																					Percentages.								
Means	10.5	11.9	11.9	8.4	10.7	18.2	11.8	13.5	3.0	44.7	47.3	45.9	46.0	82.0	73.4	83.4	79.6	4.6	5.1	4.3	4.7	35.8	37.2	27.0	35.8	4.4	19.7	0	1.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.11 a. m., 3.11 p. m., and 11.11 p. m., local time.

Correction for instrumental error of barometer used: From 7.11 a. m., January 1, to December 31, 1884, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.01; February, 0.01; March, 0.01; April, 0.01; May, 0.01; June, 0.01; July, 0.01; August, 0.01; September, 0.01; October, 0.01; November, 0.01; December, 0.01.

REMARKS.—August 10, 2.07 p. m., three light shocks of earthquake were felt in this city which were of about three seconds duration, appeared to be from NE. to SW.

B. A. BLUNDON,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

AUGUSTA, GA.

Location of office on December 31, 1884, Cotton Exchange Building, Reynolds street.

[Latitude, 33° 28′ N.; longitude, 81° 54′ W. Elevation of barometer above sea-level, 183 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 89 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	8 p. m.	11 p. m.							7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.077	30.024	30.067	30.056	30.529	27	29.468	8	1.061	37.4	50.8	42.6	43.4	68.0	31	14.0	6	54.0	52.3	34.6	4.34	1.63	7, 8	20	W.	2	W.	2,898
Feb	29.979	29.916	29.952	29.949	30.357	16	29.401	27	.956	48.8	66.1	54.6	56.5	78.0	12	24.0	29	54.0	67.9	46.4	3.98	1.16	17	32	S. W.	19 28	S.	2,958
Mar	29.926	29.869	29.906	29.900	30.270	16	29.502	1	.768	53.2	67.0	58.7	59.6	82.0	25	27.5	1	54.5	68.8	50.5	6.97	1.57	13	22	NE.	13	SE.	3,341
Apr	29.822	29.756	29.795	29.791	30.025	12	29.410	2	.615	55.4	70.6	60.4	62.1	87.8	30	40.0	10	47.8	71.7	52.4	3.68	1.88	14, 15	32	W.	2	W.	2,801
May	29.860	29.788	29.827	29.825	30.071	31	29.565	27	.506	67.8	82.8	71.3	74.0	90.0	21	54.5	31	35.5	84.0	65.0	3.21	1.09	25	19	NW.	24	SE.	2,345
June	29.902	29.839	29.876	29.872	30.136	16	29.559	10	.577	69.6	80.5	72.6	74.2	92.0	21	57.5	8	34.5	82.3	67.2	4.34	1.85	24	24	NW.	21	NE.	2,929
July [1]	29.826	29.759	29.803	29.796	30.003	23	29.617	16	.386	75.7	88.4	78.7	80.9	94.0	13 14	65.6	9	28.4	89.9	72.9	3.25	0.66	28, 29	24	NW. W.	11 26	SE. S. SW.	2,493
Aug. [2]	29.908	29.848	29.891	29.882	30.058	19	29.626	30	.432	73.1	87.8	76.9	79.1	93.8	21	64.0	14	29.8	88.3	70.9	4.36	3.08	7	18	E. NE.	6 10	NE.	2,218
Sept	29.972	29.902	29.955	29.943	30.166	14	29.684	11	.482	70.1	84.7	77.4	76.4	91.0	8	57.0	17	34.0	85.3	68.2	4.24	2.43	10, 11	22	N.	12	NE.	2,861
Oct. [1]	30.034	29.945	29.995	29.991	30.312	20	29.712	9	.600	63.2	80.5	68.0	70.6	93.5	6	38.0	25	55.5	81.3	60.9	0.83	0.71	10	16	NE.	15	NE.	2,319
Nov. [3]	30.000	29.922	29.970	29.964	30.308	7	29.359	28	.949	45.8	66.3	52.3	54.8	77.0	23	33.5	25	43.5	67.4	43.6	1.71	1.19	28	24	SW.	28	NW.	2,090
Dec. [4]	30.054	29.976	30.021	30.017	30.423	27	29.535	6	.888	44.6	57.7	49.8	50.7	74.6	22	23.0	20	51.6	60.1	41.6	4.19	1.59	22	19	SW.	22	NE.	2,116
Sums	359.360	358.544	359.068	358.986	......	...	....	...	8.220	704.7	882.2	760.8	782.8	....	....	......	...	523.1	899.3	674.2	45.10	....	......	...	....	...	....	31,364
Means	29.947	29.879	29.922	29.916	30.529	[5]27	29.359	[6]28	.683	58.7	73.5	63.4	65.2	94.0	13 [7]14	14.0	[5]6	43.6	74.9	56.2	.....	....	......	...	....	...	NE.	......

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[1] One 7 a. m. observation missed.

[2] One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range.

[3] Three 7 a. m. observations missed.

[4] Two 7 a. m. observations missed.

[5] January.

[6] November.

[7] July.

AUGUSTA, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days.								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan	4	16	2	6	10	8	21	4	22	31.6	32.5	33.7	32.6	79.5	53.5	71.6	68.2	5.5	6.4	4.6	5.5	10	9	12	12	2	11	0	0	22	8	20	5	0	10	17	8	9	4.1
Feb	1	4	0	9	23	7	21	3	19	43.3	42.9	45.6	43.9	81.5	45.2	72.1	66.3	5.0	5.0	2.6	4.2	12	11	6	8	0	1	0	3	22	6	18	7	0	7, 8	15	6	10	6.7
Mar	3	2	3	18	10	10	16	9	22	45.8	44.8	48.2	46.3	77.2	49.4	69.2	65.3	6.0	5.4	3.8	5.1	10	11	10	16	0	1	0	3	26	4	21	7	3	5	19	1	17	4.5
Apr	2	6	5	8	1	9	22	14	23	47.8	44.8	49.4	47.3	76.3	44.5	69.1	63.3	5.9	6.1	3.6	5.2	10	11	9	11	0	0	0	2	27	11	16	8	3	12	19	8	12	5.5
May	1	12	3	18	6	9	15	12	17	61.1	56.6	62.3	60.0	79.6	42.7	74.1	65.5	5.5	4.6	3.1	4.4	10	16	5	10	0	0	0	8	9	10	7	6	8	31	3	2	7	10.9
June	3	24	8	15	14	9	1	9	7	64.5	63.7	66.2	64.8	84.1	59.0	80.9	74.7	7.4	7.7	4.9	6.7	4	11	15	14	0	0	3	5	25	9	26	6	2	4 5 6	19	7	11	1.8
July[1]	3	9	4	17	17	17	11	8	6	69.9	69.4	72.3	70.5	82.9	55.1	81.1	73.0	6.2	4.6	2.9	4.6	9	17	4	10	0	0	15	5	16	1	6	6	0	27	10	1	8	7.5
Aug.[2]	4	29	6	12	6	7	7	10	10	68.2	65.8	69.5	67.8	84.7	50.1	78.6	71.1	4.5	5.6	3.0	4.4	9	19	1	9	0	0	9	4	8	9	12	5	5	20	3	4	6	7.3
Sept	14	17	9	13	10	3	2	5	17	64.5	64.3	66.4	65.1	83.1	52.1	77.0	70.7	4.4	3.8	1.6	3.3	15	12	3	5	0	0	3	1	6	7	12	4	6	25 26 29	2	1	4	11.6
Oct.[1]	8	20	15	11	8	4	4	6	16	56.4	55.6	59.6	57.2	80.2	43.8	75.6	66.5	2.1	3.0	1.6	2.2	22	6	2	2	0	0	5	1	5	7	13	4	1	15	1	6	4	7.1
Nov.[3]	10	9	3	5	5	5	13	23	14	39.4	40.9	43.0	41.1	78.6	42.4	71.4	64.1	3.7	3.4	3.1	3.4	14	8	5	5	0	0	0	0	7	0	25	4	8	9	2	4	5	2.4
Dec.[4]	4	20	6	4	3	6	10	2	36	39.2	42.9	42.5	41.5	82.4	60.4	77.3	73.4	7.5	6.5	5.1	6.4	4	14	11	15	0	4	0	2	20	6	16	5	3	4, 5	15	3	9	0.9
Sums	57	168	64	136	113	94	143	105	209	631.7	624.2	658.7	638.1	970.1	598.2	898.0	822.1	63.7	62.1	39.9	55.4	129	145	83	117	2	17	35	34	......		...	......		....	129	3	107	10.3
	Percentages.																					Percentages.																	
Means.	5.2	15.5	5.9	12.5	10.4	8.6	13.1	9.6	19.2	52.6	52.0	54.9	53.2	80.8	49.8	74.8	68.5	5.3	5.2	3.3	4.6	36.1	40.6	23.2	32	[5].5	[5]4.6	[5]9.6	[5]9.3	27	11	[6]16	4	1	[7]15	10	9.2	8	11.9

[1] One 7 a. m. observation missed. [2] One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range. [3] Three 7 a. m. observations missed. [4] Two 7 a. m. observations missed. [5] Percentage of 366 days. [6] April. [7] October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, 1884, to 11 p. m., December 31, 1884, inclusive, —.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.200; February, 0.200; March, 0.200; April, 0.190; May, 0.190; June, 0.190; July, 0.190; August, 0.190; September, 0.190; October, 0.190; November, 0.200; December, 0.200.

REMARKS.—Last frost of spring April 10; first light frost of autumn October 16; first killing frost of autumn October 25. No changes have been made in the elevation of any of the instruments during the year.

W. J. EVANS,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BALTIMORE, MD.

Location of office on December 31, 1884, Baltimore Fire Insurance Co.'s Office, corner South and Water streets.

[Latitude, 39° 18' N.; longitude, 76° 37' W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 69 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.152	30.096	30.124	30.124	30.831	27	29.214	8	1.617	28.9	34.9	32.2	32.0	52.0	14	8.0	6	44.0	39.0	25.0	4.81	1.70	8, 9	24	W.	2	W.	4,609
Feb	30.056	30.035	30,083	30.058	30.721	16	29.289	28	1.432	40.3	45.5	40.7	42.2	68.2	6	10.5	29	57.7	48.6	34.7	6.69	1.30	23	31	NW.	28	NW.	4,273
Mar	30.030	29.972	30.029	30.010	30.438	16	29.487	26	.951	40.5	48.5	43.1	44.0	64.5	26	14.0	1	50.5	50.2	37.4	6.37	1.48	19	26	NW.	30	NW.	4,615
Apr	29.884	29.817	29.875	29.859	30.193	12	29.170	2	1.019	48.1	58.0	50.8	52.3	79.7	28	34.0	9	45.7	59.8	45.2	2.05	1.31	9	28	NW.	3	NW.	5,189
May	29.955	25.898	29.935	29.929	30.280	3	29.614	11	.666	60.9	71.4	62.1	64.8	89.0	24	44.9	29	44.1	72.8	56.9	3.17	0.74	28	23	W.	2	NW.	4,483
June	30.066	30.010	30.037	30.041	30.454	15	29.672	9	.782	69.1	80.1	70.3	73.2	92.6	22	52.3	16	40.3	81.8	64.4	2.51	0.89	13, 14	18	SW.	24	SE.	3,655
July	29.878	29.814	29.855	29.849	30.037	22	29.594	13	.443	70.9	82.3	72.0	75.1	94.8	24	59.6	9	35.2	83.4	67.6	9.43	3.75	11	32	NW.	31	NW.	4,074
Aug	30.040	29.993	30.027	30.020	30.278	25	29.678	30	.600	71.1	81.8	72.7	75.2	93.5	20	58.9	25	34.6	83.0	68.4	1.74	0.66	30, 31	17	NW.	30	N.	3,237
Sept	30.105	30.036	30.075	30.072	30.450	14	29.704	17	.746	65.8	80.5	70.0	72.1	92.6	10	49.3	15	43.3	81.4	63.5	0.09	0.08	30	18	S.	24	S.	3,576
Oct	30.151	30.079	30.124	30.118	30.572	26	29.702	8	.870	54.8	67.5	58.2	60.2	88.7	6	35.4	26	53.3	69.2	52.3	1.42	0.46	30	26	SW.	22	N.	3,905
Nov	30.096	30.032	30.065	30.064	30.425	22	29.456	28	.969	41.5	52.4	45.8	46.4	71.3	2	26.1	25	45.2	55.0	39.0	3.09	1.44	23	27	SE.	23	NW.	3,934
Dec	30.175	30.117	30.150	30.147	30.627	27	29.491	6	1.136	33.8	41.0	37.5	37.4	66.2	31	8.6	20	57.6	44.4	31.8	3.91	1.47	6	28	NW.	9	N.	3,928
Sums ..	360.588	359.908	360.379	360.291	....	...	......	...	11.231	625.7	743.9	654.9	674.9	....	....	......	....	551.5	768.6	586.2	45.38	....	......	...	....	....	....	49,428
Means .	30.049	29.992	30.032	30.024	30.831	*27	29.179	†2	.936	52.1	62.0	54.6	56.2	94.8	‡24	8.0	*6	46.0	64.0	48.8	.....	....	......	...	....	....	NW.	......

*January. †April. ‡July.

BALTIMORE, MD.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch of more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	16	10	6	6	10	11	19	14	1	19.3	22.8	22.5	21.5	67.0	62.5	68.2	65.9	6.4	6.6	4.0	5.7	8	13	10	15	5	24	0	0	0
Feb	15	13	13	10	7	3	9	16	1	31.9	32.2	31.7	31.9	72.8	61.7	71.2	68.6	6.8	6.1	6.2	6.4	3	14	12	19	1	10	0	1	0
Mar	10	12	9	14	5	2	5	30	6	32.5	33.5	32.8	32.9	74.7	59.6	68.1	67.5	6.7	6.5	5.6	6.3	6	13	12	19	2	7	0	1	0
Apr	19	7	2	14	9	4	5	29	1	36.1	35.9	37.3	36.4	64.4	47.6	61.4	57.8	5.5	6.4	4.9	5.6	7	14	9	11	0	0	0	0	0
May	12	4	5	16	17	4	11	23	1	48.6	47.4	49.4	48.5	65.6	46.1	65.4	59.0	4.5	4.4	5.2	4.7	9	15	7	13	0	0	0	5	0
June	10	10	18	21	13	5	5	5	3	59.3	59.6	61.1	60.0	72.2	51.8	73.6	65.9	4.8	4.8	3.7	4.4	13	10	7	10	0	0	4	3	0
July	14	2	7	10	12	10	15	22	1	61.3	59.5	61.7	60.8	73.4	49.0	71.5	64.6	4.6	6.0	4.8	5.1	8	13	10	13	0	0	3	6	0
Aug	19	14	10	16	16	6	4	6	2	62.9	64.1	65.0	64.0	75.9	56.5	77.1	69.8	5.2	5.5	3.6	4.8	9	16	6	10	0	0	3	3	0
Sept	10	7	6	18	21	16	4	8	0	56.5	57.5	59.7	57.9	72.5	47.6	70.4	63.5	3.0	3.1	0.9	2.3	19	11	0	2	0	0	3	0	0
Oct	25	6	9	6	15	7	13	11	1	46.8	45.9	46.8	46.5	75.0	48.9	67.4	63.8	4.0	4.3	3.9	4.1	16	7	8	9	0	0	0	0	0
Nov	15	6	5	8	3	14	12	26	1	31.0	33.2	35.0	33.1	67.6	50.4	67.8	61.9	3.8	4.3	3.5	3.9	15	6	9	8	0	4	0	1	0
Dec	25	4	12	7	5	10	11	19	0	24.7	29.3	28.6	27.5	68.9	65.8	71.0	68.6	6.1	6.9	4.3	5.8	10	8	13	13	4	9	0	0	0
Sums	190	95	102	146	133	92	113	209	18	510.9	520.9	531.6	521.0	850.0	647.5	833.1	776.9	61.4	64.9	50.6	59.1	123	140	103	142	12	54	13	20	0
	Percentages.																					Percentages.								
Means	17.3	8.7	9.3	13.3	12.1	8.4	10.3	19.0	1.6	42.6	43.4	44.3	43.4	70.8	54.0	69.4	64.7	5.1	5.4	4.2	4.9	33.6	38.3	28.1	38.8	3.3	14.8	3.6	5.5	0.0

NOTE.—7 a. m., 3 p. m. and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time.

Corrections for instrumental error of barometer used: From 7.02 a. m., January 1, to 11.02 p. m., September 4, inclusive, +.025 inch: from 7.02 a. m., September 5, to 11.02 p. m., December 31, inclusive, +.008 inch. Barometer 316 adopted as station instrument per instructions of August 9, 1884.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, frequent rains and snows. February, unusually wet month; lunar halo 3d; thunder-storm 14th. March, much cloudy weather and rain; thunder-storm 9th; last frost of the season 17th. April, lunar corona 28th. May, thunder-storms 9th; 13th, 19th, 23d, and 24th. June, thunder-storms 3d, 22d, and 25th. July, excessive rainfall; heavy rain and thunder-storm 11th; thunder-storm 2d, 5th, 11th, 24th, 25th, and 31st; rainbow 27th. August, lunar halo 1st; earthquake shock 10th; thunder-storms 4th, 21st, and 29th; rainbow 29th. September, severe drought during month; total rainfall .09 inch, smallest rainfall on record for any month (1871–1884). October, lunar halo 4th; solar halo 26th. November, heavy frost 7th (first of season); lunar corona 4th and 30th. December, lunar corona 5th.

GEO. W. FELGER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BARNEGAT CITY, N. J.

Location of office on December 31, 1884, corner Central Avenue and Sixth street.

[Latitude, 39° 46′ N.; longitude, 74° 6′ W. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.136	30.089	30.115	30.113	30.828	27	29.139	9	1.689	26.6	31.7	28.3	28.9	52.0	2	7.0	7	45.0	36.0	22.0	5.25	2.50	8, 9	68	E.	9	N.	13,173
Feb	30.043	30.030	30.082	30.052	30.716	16	29.145	28	1.571	37.1	39.8	36.5	37.8	56.8	20	*13.0	29	*43.8	44.6	*34.0	1.11	.19	28	52	NW.	28, 29	NW.	10,721
Mar	30.018	29.956	30.011	29.995	30.454	16	29.470	26	.984	36.3	42.3	38.5	39.0	63.0	28	†11.3	1	51.7	45.9	(†)	2.38	.58	19, 20	48	NW.	30	NW.	11,876
Apr	29.845	29.793	29.842	29.827	30.176	14	29.092	2	1.084	45.4	50.3	45.0	46.9	61.9	29	‡32.3	7	‡29.6	53.8	‡41.5	.97	.32	2	48	NW.	3, 4	NW.	10,316
May	29.943	29.911	29.947	29.934	30.289	31	29.571	11	.718	57.9	61.9	56.3	58.7	81.2	2	42.4	29	38.8	66.6	51.6	.79	.28	28	36	NW.	10	SW.	10,071
June	30.072	30.955	30.057	30.061	30.491	15	29.744	9	.747	65.8	69.1	63.7	66.2	82.8	8	48.1	16	34.7	72.8	58.9	2.24	2.03	26	59	E.	26	SW.	9,743
July	29.861	29.823	29.845	29.843	29.985	22	29.571	13	.414	68.8	73.8	68.8	70.5	88.8	24	56.1	29	32.7	77.7	63.2	3.73	1.18	29	30	SE.	27	SW.	9,394
Aug	30.039	30.017	30.033	30.030	30.312	25	29.716	30	.596	69.8	73.9	69.6	71.1	86.3	20	60.7	11	25.6	77.4	65.8	5.04	2.06	7	32	SW.	29	SW.	8,891
Sept	30.107	30.065	30.093	30.088	30.445	14	29.733	17	.712	67.7	72.7	67.4	69.3	85.5	5	51.7	21	33.8	76.1	62.2	1.05	.87	12	32	SW.	16	SW.	8,978
Oct	30.140	30.087	30.124	30.117	30.570	2[illegible]	29.733	8	.837	55.7	62.5	56.7	58.3	81.1	4	32.6	26	48.5	66.7	50.8	2.19	1.04	30, 31	36	NW., E.	18, 30	SW.	10,371
Nov	30.078	30.035	30.050	30.054	30.457	22	29.409	28	1.048	43.2	50.7	45.4	46.4	65.6	23	24.6	25	41.0	55.2	38.1	2.68	1.06	28, 29	52	S.	23	NW.	9,970
Dec	30.164	30.112	30.184	30.137	30.616	27	29.601	6	1.015	35.9	41.6	38.2	38.6	62.1	7	— 0.2	20	62.3	46.4	31.6	7.09	1.97	21	56	S.	6	N.	12,077
Sums	360.446	359.978	360.333	360.251	......	...	....	...	11.415	610.2	670.3	614.4	631.7	...	....	....	....	487.5	719.2	.....	34.52	....	......	...	....	.....	....	125,081
Means	30.037	29.998	30.028	30.021	30.828	§27	29.092	‖2	.951	50.8	55.9	51.2	52.6	88.8	¶24	— 0.2	**20	40.6	59.9	.....	.....	....	......	...	....	.....	SW.	....

* First 20 days only. † Lowest exposed. ‡ 25 days. § January. ‖ April. ¶ July. ** December.

BARNEGAT CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	22	12	7	4	3	18	14	13	0	21.0	24.8	21.9	22.6	79.4	76.3	77.5	77.7	6.3	7.5	4.8	6.2	5	15	11	15	10	27	0	0	0
Feb	8	11	14	10	6	15	5	18	0	34.5	35.5	32.9	34.3	90.6	85.7	86.8	87.7	5.6	5.7	6.9	6.1	3	16	10	15	1	*6	0	0	0
Mar	14	18	6	8	6	14	8	19	0	31.0	34.6	32.3	32.6	82.4	76.1	79.1	79.2	6.1	6.3	4.9	5.8	8	13	10	14	3	(†)	0	0	0
Apr	15	8	8	13	1	13	4	25	3	37.2	37.9	38.1	37.7	73.9	64.3	77.3	71.8	5.2	6.6	5.0	5.6	8	10	12	8	0	‡10	0	0	0
May	8	9	6	3	12	29	5	18	3	50.3	49.7	49.8	49.9	77.2	66.3	79.9	74.5	4.8	4.5	5.7	5.0	6	19	6	9	0	0	0	0	0
June	5	8	24	7	7	30	4	5	0	58.5	58.8	58.5	58.6	78.4	70.7	83.7	77.6	3.5	3.8	3.2	3.5	16	10	4	5	0	0	0	0	0
July	12	5	10	9	9	22	9	17	0	61.6	61.2	62.9	61.9	78.9	67.5	82.1	76.2	6.0	4.8	5.4	5.4	5	19	7	12	0	0	0	5	0
Aug	13	11	13	8	16	24	3	5	0	65.9	67.1	66.2	66.4	88.1	79.9	89.4	85.8	6.0	4.9	4.5	5.1	9	12	10	11	0	0	0	3	0
Sept	11	3	8	5	12	30	16	5	0	62.5	65.0	63.3	63.6	84.1	77.3	87.2	82.9	4.0	3.4	1.6	3.0	14	13	3	4	0	0	0	0	0
Oct	16	8	13	2	7	19	12	16	0	51.0	53.5	51.9	52.1	84.7	73.9	84.4	81.0	4.7	4.2	5.4	4.8	11	13	7	13	0	0	0	0	0
Nov	12	12	3	7	6	13	15	21	1	39.0	41.9	40.9	40.6	85.4	72.7	84.6	80.9	3.3	4.6	3.5	3.8	17	7	6	7	0	4	0	0	0
Dec	18	11	6	2	7	16	14	17	2	32.2	35.4	34.5	34.0	85.5	79.3	86.7	83.8	5.8	6.7	6.0	6.2	7	11	13	12	4	11	0	1	0
Sums ..	154	116	118	78	92	243	109	179	9	544.7	565.4	553.2	554.3	988.6	890.0	998.7	959.1	61.3	63.0	56.9	60.5	109	158	99	125	18	.....	0	9	0
	Percentages.																					Percentages.								
Means .	14.0	10.6	10.7	7.1	8.4	22.1	9.9	16.3	0.8	45.4	47.1	46.1	46.2	82.4	74.2	83.2	79.9	5.1	5.2	4.7	5.0	29.8	43.2	27.0	34.2	4.9	.....	0	2.5	0

* First 20 days only. † Both minimum thermometers broken. ‡ For 25 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, —.011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

GERALD E. GRIFFIN,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BENNETT, FORT, DAK.

Location of office on December 31, 1884, room formerly adjutant's office.

[Latitude, 44° 43′ N.; longitude, 100° 39′ W. Elevation of barometer above sea-level, 1,510 (B) feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 18 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only). Washington time. 7 a. m.	Barometer: Washington time. 3 p. m.	Barometer: Washington time. 11 p. m.	Barometer: Monthly mean.	Barometer: Highest.	Barometer: Date.	Barometer: Lowest.	Barometer: Date.	Barometer: Range.	Temperature. Washington time. 7 a. m.	Temperature: Washington time. 3 p. m.	Temperature: Washington time. 11 p. m.	Temperature: Washington time. Monthly mean.	Temperature: Self-registering thermometers. Maximum.	Temperature: Self-registering thermometers. Date.	Temperature: Self-registering thermometers. Minimum.	Temperature: Self-registering thermometers. Date.	Temperature: Self-registering thermometers. Absolute range.	Temperature: Mean maximum.	Temperature: Mean minimum.	Precipitation. Total amount.	Precipitation: Any 8 consecutive 8-hourly measurements. Largest amount.	Precipitation: Any 8 consecutive 8-hourly measurements. Date.	Wind. Maximum hourly velocity during month. Miles.	Wind: Maximum hourly velocity during month. Direction from—	Wind: Maximum hourly velocity during month. Date.	Wind: Prevailing direction.	Wind: Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.575	28.525	28.560	28.553	29.255	4	27.963	9	1.292	5.0	19.1	12.4	12.2	49.0	12	−31.0	4	80.0	24.8	−1.8	.31	.12	5, 6	40	NW.	9	NW.	4,526
Feb	28.497	28.472	28.524	28.498	29.007	11	27.597	18	1.410	.7	10.9	5.2	5.6	50.2	24	−32.5	9	82.7	17.2	−6.2	.57	.14	2, 3	[2]23	NW.	1	NW.	[1]1,144
Mar	28.407	28.383	28.395	28.395	28.763	13	27.597	10	1.166	20.6	34.5	27.5	27.5	70.9	26	−11.0	9	81.9	39.4	17.0	1.08	.60	27, 28	[2]38	NW.	11	NW.	[3]1,701
Apr	28.416	28.386	28.411	28.404	28.966	20	27.839	29	1.127	35.1	50.9	41.5	42.5	74.0	24	19.0	7	55.0	54.7	31.9	2.85	1.86	28, 29	35	NW.	6	SE.	8,150
May	28.406	28.362	28.385	28.384	28.641	24	27.923	4	.718	47.1	68.6	56.2	57.3	86.0	8	31.8	1	54.2	71.4	44.7	2.69	.98	21	42	NW.	4	SE.	6,621
June	28.359	28.323	28.334	28.339	28.581	1	27.996	11	.585	62.5	83.2	70.4	72.0	97.3	27	43.5	2	53.8	85.6	59.7	3.10	.77	15	37	NW.	6	SE.	6,385
July	28.365	28.326	28.344	28.345	28.613	19	28.026	22	.587	62.1	78.7	67.0	69.3	97.0	7	50.0	5	47.0	82.5	58.4	3.79	.87	25	42	NW.	4	SE.	5,725
Aug	28.408	28.366	28.370	28.381	28.675	3	27.979	31	.696	60.0	81.3	68.4	69.9	98.0	27	45.2	4	52.8	84.8	57.4	.74	.74	19, 20	35	NW.	2	SE.	6,996
Sept	28.311	28.274	28.302	28.296	28.725	19	27.898	2	.827	51.6	73.7	59.1	61.5	92.0	5 13	29.9	30	62.1	76.8	48.0	.68	.47	15	32	SE.	12	NW.	6,877
Oct	28.446	28.394	28.418	28.419	28.805	22	27.933	2	.872	42.0	61.2	48.6	50.6	85.0	2 14	16.0	23	69.0	65.9	37.8	.96	.93	4, 5	36	NW.	26	NW.	6,276
Nov	28.531	28.486	28.520	28.512	28.868	5	27.989	26	.879	20.8	43.5	30.8	31.7	69.8	6	−11.0	23	80.8	47.7	16.7	.17	.15	29	32	NW.	19	NW.	3,819
Dec	28.528	28.518	28.550	28.532	29.083	24	27.985	5	1.098	4.9	14.6	8.6	9.4	58.0	1	−41.3	25	99.3	19.3	−0.9	.46	.18	28	28	NW.	10	NW.	5,094
Sums	341.249	340.815	341.113	341.058	....	...	....	...	11.257	412.4	620.2	495.7	509.5	....	...	......	...	818.6	670.1	362.7	16.90	....	......	...	....	....	...	63,341
Means	28.437	28.401	28.426	28.421	29.255	[4]4	27.597	[5]10 [6]18	.938	34.4	51.7	41.3	42.5	98.0	[7]27	−41.3	[8]25	68.2	55.8	30.2	....	....	......	...	....	....	NW.	......

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[1] Self-register defective; for 10 days only. [2] Approximate. [3] Self-register defective; for 9 days only. [4] January. [5] March. [6] February. [7] August. [8] December.

BENNETT, FORT, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	3	3	3	18	1	3	2	30	25	− 1.4	11.3	7.2	5.7	76.0	72.0	79.6	75.9	3.7	6.5	3.0	4.4	11	15	5	7	20	31	0	0	0
Feb	9	13	3	3	0	0	2	41	11	− 2.9	4.4	.5	.7	85.3	76.0	82.0	81.1	5.8	6.7	3.9	5.5	7	14	8	12	20	28	0	0	0
Mar	4	19	2	20	0	3	0	26	18	16.3	24.2	22.2	20.9	83.4	68.1	80.5	77.3	5.4	6.0	5.1	5.5	10	10	11	11	8	28	0	0	0
Apr	5	18	1	34	0	4	1	23	4	30.0	30.9	32.8	31.2	81.3	50.3	73.1	68.4	6.5	5.9	4.6	5.7	8	9	13	10	1	14	0	0	1
May	5	14	1	30	4	2	7	24	6	41.8	41.1	45.7	42.9	82.2	41.6	69.0	64.3	4.0	5.0	3.6	4.2	14	11	6	9	0	1	0	3	0
June......	5	5	0	56	2	7	0	12	3	57.4	60.0	60.4	59.3	83.8	46.9	71.4	67.4	3.7	4.2	2.9	3.6	15	13	2	9	0	0	10	8	0
July	4	26	1	30	1	5	1	17	8	57.3	57.3	57.3	57.3	84.6	50.9	72.1	69.2	5.8	6.2	3.9	5.3	7	18	6	14	0	0	4	13	0
Aug	1	18	1	48	1	4	2	21	7	54.5	51.8	54.8	53.7	82.8	38.3	62.9	61.2	3.9	4.5	1.4	3.3	15	14	2	2	0	0	7	2	0
Sept	7	9	1	25	0	9	3	27	9	44.1	43.0	45.4	44.2	77.0	35.3	61.8	58.0	4.5	4.6	2.6	3.9	14	12	4	4	0	1	3	5	0
Oct	5	2	1	27	1	6	4	34	13	35.0	36.0	34.8	35.3	76.1	41.4	60.6	59.4	4.1	4.5	3.5	4.0	14	11	6	4	0	7	0	2	0
Nov	4	11	1	16	2	3	1	31	21	17.8	27.0	24.0	22.9	87.7	55.8	75.8	73.1	3.9	4.7	2.4	3.7	13	13	4	2	4	30	0	0	1
Dec	7	8	0	17	1	2	1	40	17	2.0	7.8	4.0	4.4	88.5	74.6	82.8	82.0	5.2	6.6	5.3	5.7	7	16	8	9	21	31	0	0	0
Sums ..	59	146	16	324	13	48	24	326	142	351.9	394.8	389.1	378.5	988.7	651.2	871.6	837.3	56.5	65.4	42.2	54.8	135	156	75	93	74	171	24	33	2
	Percentages.																					Percentages.								
Means .	5.4	13.3	1.5	29.5	1.2	4.4	2.2	29.7	12.9	29.3	32.9	32.4	31.5	82.4	54.3	72.6	69.8	4.7	5.4	3.5	4.5	36.9	42.6	20.5	25.4	20.2	46.7	6.6	9.0	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.26 a. m., 1.26 p. m., and 9.26 p. m., local time.

Correction for instrumental error of barometer used: From 5.26 a. m., January 1, 1884, to 9.26 p. m., December 31, 1884, inclusive, +.022.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.740; February, 1.730; March, 1.700; April, 1.640; May, 1.560; June, 1.540; July, 1.540; August, 1.540; September, 1.590; October, 1.620; November, 1.690; December, 1.760.

REMARKS.—April, navigation opened on 6th; May, frequent rains, thunder-storms; June, heavy rains, thunder-storms; July, continued heavy rains, hail-storm 1st; August, very dry, high temperature; September, continued dry weather; October, first snow 20th, frequent frosts; December, remarkably low temperature, snow.

A. PRITCHARD,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BENTON, FORT, MONT.

Location of office on December 31, 1884, Grand Union Hotel.

[Latitude, 47° 50′ N.; longitude, 110° 40′ W. Elevation of barometer above sea-level, 2,681 (B) feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 49 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometer.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	27.320	27.297	27.292	27.303	27.708	4	26.833	8	.875	12.5	25.3	18.8	18.9	47.0	12	—24.0	4	71.0	27.2	6.8	.56	.17	3, 4, 9	40	SW.	31	SW.	4,455
Feb	27.256	27.247	27.271	27.258	27.748	10	26.582	17	1.166	2.8	15.0	9.0	8.9	51.5	24	—35.0	12	86.5	19.6	—1.9	[1].11	[1].09	[1]4	[2]48	SW.	24	SW.	[2]3,532
Mar	27.130	27.168	27.119	27.139	27.529	20	26.664	26	.865	28.2	42.8	32.9	34.6	59.1	24	13.2	2	45.9	44.6	25.8	.....	.....	....	28	SW.	25, 31	NE.	3,058
Apr.[3]	27.207	27.165	27.186	27.186	27.687	18	26.751	12	.936	31.2	53.7	41.3	42.1	74.2	23	18.1	6	56.1	56.0	30.4	[4].46	[4].16	[4]26, 27	36	NW.	9	NE.	5,100
May	27.159	27.224	27.200	27.194	27.519	29	26.914	27	.605	42.0	71.0	53.7	55.6	88.5	24	30.0	1	58.5	73.7	40.2	1.09	.47	28	32	W. SW. NE.	10 11 19	W.	4,137
June	27.148	27.129	27.121	27.133	27.419	30	26.940	13	.479	53.3	78.0	64.6	65.3	100.2	19	44.1	27	56.1	81.3	51.9	2.18	.71	5	36	W.	13	NE.	4,544
July[5]	27.205	27.158	27.183	27.182	27.844	12, 17, 18	26.868	31	.476	50.5	75.8	64.4	65.6	89.5	20	38.8	4	50.7	80.8	52.1	3.09	1.21	15, 16	50	SW.	3	SW.	5,777
Aug	27.243	27.202	27.205	27.217	27.454	2	26.947	28	.507	56.0	81.7	69.1	68.9	99.4	26	35.5	20	63.9	85.4	51.1	.79	.41	1	40	W.	1	NE.	4,742
Sept.[6]	27.173	27.121	27.155	27.150	27.466	19	26.843	27	.623	43.3	63.2	51.3	52.6	88.7	20	24.1	30	64.6	66.6	40.6	1.44	.34	13, 14	40	SW.	27	SW.	5,059
Oct.[7]	27.207	27.163	27.192	27.187	27.594	16	26.798	1	.796	35.4	58.1	45.6	46.4	81.4	17	19.5	7	61.9	60.9	33.6	.36	.23	2, 3	[2]40	[8]SW.	3, 31	SW.	[8]6,894
Nov	27.317	27.282	27.294	27.298	27.570	16	26.992	24	.578	26.2	50.8	36.5	37.8	71.6	7	— 7.8	23	79.4	53.5	24.8	.29	.18	21	48	SW.	26	SW.	5,006
Dec	27.300	27.279	27.295	27.291	27.716	9	26.835	5	.881	—4.8	8.1	1.2	1.5	69.2	1, 2	—56.5	24	125.7	12.2	—9.0	1.01	.24	18, 19	28	SW., W.	2, 3	SW.	4,457
Sums ..	326.665	326.435	326.513	326.538	......	....	....	..	8.787	382.6	623.5	488.4	498.2	.....	.....	....	...	820.3	661.3	346.4	.....	.....	....	...	....	.....	......	56,751
Means .	27.222	27.203	27.209	27.211	27.748	[9]10	26.582	[9]17	.732	31.9	52.0	40.7	41.5	100.2	[10]19	—56.5	[11]24	68.4	55.1	28.9	.....	.....	....	...	....	.....	SW.	......

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[1] Eight days.
[2] Twenty-four days.
[3] One 7 a. m., two 3 p. m., one 11 p. m. observations missed.
[4] Twenty-seven days.
[5] Two 7 a. m., two 3 p. m., two 11 p. m. observations missed.
[6] Four 7 a. m., four 3 p. m., four 11 p. m. observations missed.
[7] Three 7 a. m., three 3 p. m., three 11 p. m. observations missed.
[8] Thirty-one days.
[9] February.
[10] June.
[11] December.

BENTON, FORT, MONT.—Continued.

Month.	Winds at 7 a.m., 3 and 11 p.m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.	3 p.m.	11 p.m.	Mean.	7 a.m.	3 p.m.	11 p.m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	3	7	0	0	0	25	6	6	46	0.7	12.0	5.4	6.0	62.0	59.7	58.3	60.0	6.9	7.1	5.0	6.3	5	13	13	8	14	28	0	0	0
Feb	4	10	6	0	0	23	11	7	26	−0.8	9.5	4.1	4.3	76.1	80.7	81.8	79.5	7.8	5.8	5.9	6.5	2	17	10	[1]2	19	25	0	0	0
Mar	4	18	0	0	0	13	7	10	41	22.3	34.4	26.6	27.8	77.7	74.0	77.6	76.4	6.0	3.6	4.2	4.6	14	7	10	......	3	31	0	0	1
Apr.[2]	3	21	5	0	2	12	10	12	21	23.7	30.8	29.2	27.9	75.5	48.4	66.3	63.4	5.5	5.3	3.9	4.9	7	15	6	[3]7	0	19	0	0	0
May	6	12	4	4	2	12	14	11	28	32.1	47.9	39.0	39.7	69.5	48.3	60.6	59.5	4.2	3.6	3.4	3.7	15	12	4	6	0	4	0	0	0
June	3	15	10	5	1	14	12	3	27	43.4	54.3	49.7	49.1	70.8	50.9	61.3	61.0	3.7	4.3	4.8	4.3	10	16	4	13	0	0	5	6	0
July[4]	2	18	13	7	5	24	14	1	6	48.7	48.5	49.6	48.9	75.8	41.6	62.1	59.8	4.8	4.6	4.4	4.6	11	14	4	15	0	0	0	6	0
Aug	0	27	8	4	9	20	13	5	7	46.8	50.2	50.6	49.2	72.3	36.3	54.7	54.4	2.8	3.5	2.5	2.9	18	11	2	4	0	0	11	6	0
Sept.[5]	2	8	5	1	3	33	12	2	12	36.1	41.4	41.0	39.5	76.6	50.1	69.5	65.4	5.1	5.9	4.2	5.1	8	12	5	9	0	3	0	0	2
Oct.[6]	[7]1	[7]16	[7]7	[7]3	[7]3	[7]41	[7]11	[7]4	[7]7	25.5	29.4	29.8	28.2	67.2	36.1	56.0	53.1	6.0	4.6	4.6	5.1	8	11	9	4	0	12	0	0	0
Nov	3	13	3	5	8	38	12	1	7	17.3	26.1	23.5	22.3	68.7	42.0	60.0	56.9	3.6	4.3	3.5	3.8	14	9	7	4	3	22	0	0	0
Dec	2	13	3	1	3	33	8	5	25	−9.9	0.4	−4.9	−4.8	80.6	74.1	77.3	77.3	4.7	5.0	6.4	5.4	10	9	12	13	21	28	0	0	0
Sums	33	178	64	30	36	288	130	67	253	285.9	384.9	343.6	338.1	872.8	642.2	785.5	766.7	61.1	57.6	52.8	57.2	122	146	86	......	60	172	16	18	3
	Percentages.																					Percentages.								
Means	3.1	16.5	5.9	2.8	3.3	26.7	12.0	6.2	23.4	23.8	32.1	28.6	28.2	72.7	53.5	65.5	63.9	5.1	4.8	4.4	4.8	34.5	41.2	24.3	......	[8]16.8	[8]48.3	4.5	[8]4.9	0.8

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[1] Eight days.

[2] One 7 a.m., two 3 p.m., one 11 p.m. observations missed.

[3] Twenty-seven days.

[4] Two 7 a.m., two 3 p.m., two 11 p.m. observations missed.

[5] Four 7 a.m., four 3 p.m., four 11 p.m. observations missed.

[6] Three 7 a.m., three 3 p.m., three 11 p.m. observations missed.

[7] Thirty-one days.

[8] Three hundred and fifty-six days.

NOTE.—7 a.m., 3 p.m., and 11 p.m., Washington time, correspond to 4.46 a.m., 12.46 p.m., and 8.46 p.m., local time.

Correction for instrumental error of barometer used: +.026 for entire year.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.97; February, 2.99; March, 2.97; April, 2.85; May, 2.78; June, 2.76; July, 2.70; August, 2.78; September, 2.83; October, 2.90; November, 2.95; December, 2.99.

REMARKS.—February 24, the ice in the river broke; on 25th an immense gorge formed, flooding entire town. July 15, a hail-storm. September 7, first frost of season. October 2, first snow of season. December noted for its remarkable cold and calms.

B. O. LENOIR,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BISMARCK, DAK.

Location of office on December 31, 1884, corner Main and Third streets.

[Latitude, 46° 47′ N.; longitude, 100° 38′ W. Elevation of barometer above sea-level, 1,694 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 31 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.286	28.257	28.282	28.275	28.947	4	27.653	12	1.294	3.8	9.2	3.2	4.2	42.0	12	−40.0	4	82.0	14.5	−7.6	.38	.12	22	32	NW.	11	NW.	5,441
Feb	28.229	28.221	28.263	28.238	28.802	11	27.417	18	1.385	−3.8	5.1	−1.5	−0.1	44.0	24	−29.0	11	73.0	8.9	−9.8	.87	.11	4, 5 23, 29	40	NW.	18	NW.	5,352
Mar	28.156	28.145	28.151	28.151	28.488	13	27.421	10	1.067	13.2	26.2	19.7	19.7	58.5	26	−14.4	6	72.9	29.9	10.5	.60	.19	1, 2	44	NW.	11	NW.	5,209
Apr	28.190	28.178	28.179	28.182	28.751	20	27.508	29	1.243	32.5	45.4	38.1	38.7	69.8	24	17.0	7	52.8	47.6	30.2	2.20	1.40	28, 29	26	N.	30	N.	6,261
May	28.183	28.155	28.156	28.165	28.380	29	27.768	4	.612	46.4	65.1	54.6	55.4	80.1	16	29.1	1	51.0	67.1	44.1	2.56	1.53	30	28	S.	28	N.	5,131
June	28.136	28.114	28.109	28.128	28.370	1	27.828	27	.542	62.1	78.9	67.3	69.4	92.0	28	43.7	1	48.3	81.2	54.8	3.63	1.00	28, 29	36	NE., SE.	11, 26	S.	5,804
July	28.149	28.132	28.125	28.135	28.381	19	27.873	31	.508	57.4	72.1	63.5	64.8	88.9	7	32.0	6	56.9	74.6	52.6	3.62	1.25	16, 17	32	NW.	8	E.	4,914
Aug	28.164	28.145	28.147	28.152	28.432	3, 4	27.793	1	.639	56.9	75.7	64.5	65.7	91.4	15	45.2	7	46.2	77.9	55.0	3.80	1.68	15, 16 19, 20	30	N.	15	S.	5,858
Sept	28.074	28.055	28.088	28.072	28.487	19	27.631	2	.856	48.9	64.9	54.0	55.9	81.5	13	33.0	30	48.5	66.6	46.3	2.34	.71	9, 10	35	W.	8	NW.	6,187
Oct	28.182	28.148	28.170	28.165	28.569	20	27.728	10	.841	39.2	55.5	44.9	46.5	80.6	18	10.5	27	70.1	58.9	35.7	.92	.36	1, 2	35	NW.	21	NW.	7,037
Nov	28.255	28.252	28.268	28.258	28.637	4	27.718	26	.919	22.6	37.2	27.1	29.0	64.4	6	−9.5	23	73.9	41.5	18.9	.73	.15	26	32	NW.	19	NW.	3,827
Dec	28.253	28.266	28.284	28.268	28.732	24	27.727	8	1.005	3.8	8.2	3.5	5.0	45.8	8	−35.4	25	81.2	12.4	−2.7	1.71	.42	27	32	NW.	10	NW.	4,047
Sums	338.257	338.068	338.222	338.181	....	...	....	...	10.911	379.0	543.5	438.9	452.7	....	....	....	..	756.8	581.1	328.0	23.36	....	......	...	....	.....	....	65,128
Means	28.188	28.172	28.185	28.182	28.947	*4	27.417	†18	.909	31.6	45.2	36.6	37.8	92.0	‡28	−40.0	*4	63.1	48.4	27.3	.....	....	......	...	....	.....	NW.	......

* January. † February. ‡ June.

BISMARCK, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	11	7	10	4	4	3	10	34	10	−2.3	3.9	0.0	0.5	89.6	80.1	87.4	85.7	5.2	5.4	3.8	4.8	10	13	8	9	25	31	0	0	0
Feb	20	9	6	5	1	1	0	28	17	−5.9	− 0.6	−4.0	− 3.5	91.5	80.1	90.2	87.3	6.2	6.3	4.8	5.8	3	18	8	19	24	29	0	0	0
Mar	13	9	12	13	3	4	6	21	12	8.8	18.5	14.9	14.1	82.0	72.5	81.1	78.5	4.2	4.6	3.5	4.1	10	15	6	8	15	27	0	0	1
Apr	25	12	12	19	5	1	2	7	7	27.8	30.9	31.0	29.9	83.0	60.5	76.3	73.3	6.2	5.9	4.6	5.6	8	10	12	11	1	19	0	0	2
May	19	12	4	16	10	2	3	11	16	40.6	43.1	44.1	42.6	80.5	47.3	69.0	65.6	3.1	4.2	3.5	3.6	17	7	7	5	0	1	0	1	1
June......	11	8	12	15	24	2	0	6	12	58.2	59.9	60.0	59.4	87.6	53.2	78.2	73.0	4.9	3.4	4.3	4.2	9	17	4	9	0	0	2	11	1
July......	11	3	19	8	7	3	2	14	26	53.8	55.7	58.2	55.9	88.4	58.1	83.2	76.6	4.8	5.6	4.2	4.9	8	19	4	18	0	0	0	2	0
Aug	10	8	9	8	21	0	2	17	18	52.8	57.4	55.6	55.3	86.6	55.8	74.2	72.2	3.5	3.2	2.9	3.2	17	12	2	9	0	0	2	2	0
Sept	8	5	14	4	6	4	11	21	17	45.0	50.5	47.9	47.8	87.1	61.9	80.5	76.5	4.5	4.1	2.3	3.6	15	13	2	11	0	0	0	1	2
Oct	11	3	9	10	13	3	6	26	12	33.1	35.8	35.7	34.9	79.2	50.5	71.6	67.1	3.5	3.9	3.4	3.6	14	13	4	6	1	11	0	1	0
Nov	16	4	5	8	8	2	2	21	24	19.6	27.4	22.6	23.2	87.7	70.8	83.0	80.5	3.2	5.0	2.3	3.5	16	7	7	8	7	28	0	0	0
Dec......	10	2	0	9	2	3	7	35	25	.04	2.8	.04	1.0	86.5	79.3	85.5	83.8	4.7	5.0	3.6	4.4	10	15	6	13	24	30	0	0	0
Sums ..	165	82	112	119	104	28	51	241	196	331.5	385.3	366.0	361.1	1029.7	770.1	960.2	920.1	54.0	56.6	43.2	51.3	137	159	70	126	97	176	4	18	7
	Percentages.																					Percentages.								
Means .	15.0	7.5	10.2	10.8	9.5	2.6	4.6	21.9	17.9	27.6	32.1	30.5	30.1	85.8	64.2	80.0	76.7	4.5	4.7	3.6	4.3	37.4	43.4	19.1	34.4	26.5	48.1	1.1	4.9	1.9

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.26 a. m., 1.26 p. m., and 9.26 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.00; February, 1.98; March, 1.93; April, 1.88; May, 1.79; June, 1.76; July, 1.78; August, 1.76; September, 1.80; October, 1.88; November, 1.93; December, 2.02.

REMARKS.—Meteoric shower May 28.

C. S. BENNETT,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BLOCK ISLAND, R. I.

Location of office on December 31, 1884, corner of Main and Beach streets.

[Latitude, 41° 10′ N.; longitude, 71° 36′ W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 23 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only). Washington time. 7 a. m.	Washington time. 3 p. m.	Washington time. 11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Temperature. Washington time. 7 a. m.	Washington time. 3 p. m.	Washington time. 11 p. m.	Monthly mean.	Self-registering thermometers. Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Precipitation. Total amount.	Any 3 consecutive 8-hourly measurements. Largest amount.	Date.	Wind. Maximum hourly velocity during month. Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.104	30.056	30.071	30.077	30.783	27	29.243	9	1.540	27.5	31.4	29.7	29.5	54.0	2	8.0	6	46.0	37.1	23.2	6.43	1.65	8, 9	44	NW. SW. SE.	2 3 9	N.	14,115
Feb	30.057	29.997	30.066	30.040	30.776	16	28.948	28	1.828	34.0	37.1	34.0	35.0	54.0	14	10.5	29	43.5	42.6	28.0	7.31	1.10	23	44	NW.	20 29	NE.	11,175
Mar	29.987	29.942	29.959	29.963	30.407	11	29.420	26	.987	33.8	38.9	35.7	36.0	55.3	25	10.0	1	45.3	42.7	30.3	6.40	1.65	19, 20	49	NW.	30	NW.	11,733
Apr	29.787	29.750	29.790	29.776	30.167	14	28.988	2	1.179	40.7	46.2	41.7	42.9	59.5	30	30.3	1	29.3	48.9	38.0	4.10	1.77	2, 3	46	NE.	2	N., NE.	9,911
May	29.925	29.887	29.931	29.914	30.309	31	29.476	10	.833	51.5	56.8	50.6	53.0	72.2	25	39.5	30	52.7	59.9	47.0	6.39	3.18	7, 8	40	NE.	7	SW.	10,607
June	30.074	30.052	30.057	30.061	30.530	15	29.751	9	.779	61.2	65.9	59.8	62.3	82.6	21	46.2	2	36.4	68.9	55.6	2.59	1.60	26	33	NE.	26	SW.	8,816
July	29.832	29.805	29.804	29.814	30.035	4	29.529	13	.506	64.2	69.3	64.6	66.0	78.9	3	55.3	28	23.6	71.4	60.4	6.52	1.96	27, 28	39	NE.	28	SW.	9,424
Aug	30.040	30.012	30.031	30.028	30.307	25	29.701	31	.606	65.9	70.5	65.9	67.4	78.5	15	54.5	25	24.0	72.1	62.8	6.41	2.21	7, 8	32	NE.	13	SW.	7,452
Sept	30.085	30.047	30.073	30.068	30.438	14	29.710	17	.728	63.4	68.9	63.5	65.3	83.2	10	48.7	14	34.5	71.1	59.3	.62	.28	23	32	N. SW. NE.	13 16 23	SW.	8,668
Oct	30.109	30.052	30.087	30.083	30.564	26	29.649	17	.915	53.8	57.7	53.7	54.9	73.5	1	32.6	26	40.9	60.8	48.6	3.89	1.66	30	44	NE.	31	SW.	11,494
Nov	30.033	30.010	30.018	30.019	30.472	22	29.290	29	1.182	43.8	47.2	44.6	45.0	63.2	5	26.8	25	36.4	52.6	38.1	5.93	1.66	23, 24	42	NE.	19	NW.	10,450
Dec	30.132	30.090	30.094	30.105	30.650	27	29.549	7	1.101	35.2	38.3	37.4	37.0	60.0	7	— 3.2	20	65.2	44.0	31.3	6.56	1.87	15	44	NE.	26	NE.	13,608
Sums ..	360.165	359.700	359.976	359.948	....	...	....	...	12.184	573.5	628.2	581.2	594.3	.....	...	....	...	455.7	672.1	522.6	63.15	....	....	...	....	...	....	127,478
Means .	30.014	29.975	29.998	29.996	30.783	*27	28.948	†28	1.015	47.8	52.3	48.4	49.5	83.2	‡10	— 3.2	§20	38.0	56.0	43.6	.....	....	....	...	....	...	SW.	....

* January. † February. ‡ September. § December.

BLOCK ISLAND, R. I.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	24	11	6	3	4	18	12	14	1	22.7	25.3	24.6	24.2	81.5	78.1	80.9	80.2	5.1	6.0	6.2	5.8	9	12	10	14	11	25	0	0	0
Feb	9	20	7	8	6	15	3	18	1	30.8	32.8	30.0	31.2	88.1	84.9	85.8	86.3	6.8	5.8	4.5	5.7	4	16	9	17	2	20	0	1	0
Mar	14	16	2	8	3	19	8	20	3	28.2	31.9	30.3	30.1	81.1	76.9	81.1	79.7	5.5	6.2	3.8	5.2	11	12	8	17	3	15	0	0	1
Apr	22	22	3	2	6	15	4	16	0	36.6	39.6	38.0	38.1	85.6	79.3	86.8	83.9	5.4	6.1	4.7	5.4	9	10	11	12	0	2	0	1	0
May	7	12	4	8	10	25	8	19	0	47.8	49.7	46.9	48.1	87.7	79.1	86.8	84.5	3.9	4.6	3.5	4.0	15	12	4	9	0	0	0	3	0
June	5	16	3	16	2	39	4	4	1	56.8	58.6	55.9	57.1	86.0	78.2	87.4	83.9	1.7	2.5	1.9	2.0	22	6	2	6	0	0	0	2	0
July	4	9	4	7	5	37	11	15	1	60.0	62.4	60.7	61.0	86.6	79.6	87.7	84.6	4.4	4.7	4.2	4.4	9	16	6	17	0	0	0	4	0
Aug	8	17	2	7	8	37	0	5	9	63.2	65.3	63.4	64.0	91.8	84.8	91.3	89.3	4.5	5.3	4.0	4.6	8	19	4	14	0	0	0	1	0
Sept	13	8	0	5	9	40	8	5	2	58.9	61.4	59.4	59.9	85.4	78.0	87.1	83.5	3.3	3.3	2.7	3.1	17	10	3	7	0	0	0	0	1
Oct	19	12	2	5	7	21	13	10	4	47.4	48.7	47.3	47.8	81.0	73.2	79.6	77.9	5.1	5.9	5.8	5.6	8	12	11	11	0	0	0	0	0
Nov	13	10	2	5	8	15	14	21	2	38.0	39.2	39.3	38.8	81.6	74.3	82.3	79.4	5.6	5.2	4.4	5.1	10	12	8	11	0	2	0	0	1
Dec	16	26	0	4	3	22	11	10	1	31.4	33.2	33.2	32.6	85.9	82.5	84.9	84.4	7.2	5.9	6.6	6.6	3	15	13	13	4	13	0	0	0
Sums	154	179	35	78	71	303	96	157	25	521.8	548.1	529.0	532.9	1022.3	948.9	1021.7	997.6	58.5	61.5	52.3	57.5	125	152	89	148	20	77	0	12	3
	Percentages.																					Percentages.								
Means	14.0	16.3	3.2	7.1	6.5	27.6	8.7	14.3	2.3	43.5	45.7	44.1	44.4	85.2	79.1	85.1	83.1	4.9	5.1	4.4	4.8	34.2	41.5	24.3	40.4	5.5	21.0	0	3.3	0.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.22 a. m., 3.22 p. m., and 11.22 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.015 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .030; February, .030; March, .030; April, .030; May, .030; June, .030; July, .030; August, .030; September, .030; October, .030; November, .030; December, .030.

REMARKS.—January 7 and 10, lunar halo; January 23, solar halo; February 8, light frost, solar halo, polar bands; February 10, lunar corona; February 22, heavy frost; February 28, heavy rain and thunder-storm; March 1, aurora; March 18, polar bands; March 22, light frost; March 28, lightning; April 2, 16, 17, thunder-storms; April 26, meteor; April 28, light frost; May 5, 9, 20, thunder-storms; June 14, solar halo; June 19, 26, thunder-storms; July 6, 12, 18, 19, thunder-storms; August 15, mirage; August 22, thunder-storm; September 18, aurora; November 2, aurora, meteor; November 10, 16, 22, light frost; December 23, lunar halo; December 25, lunar corona.

JNO. T. EIKER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BOISÉ CITY, IDAHO.

Location of office on December 31, 1884, Davis building.

[Latitude, 43° 37′ N.; longitude, 116° 8′ W. Elevation of barometer above sea-level, 2,750 B feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 32 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.		Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	27.393	27.363	27.360	27.372	27.895	1	26.782	27	1.113	17.0	35.0	32.0	28.0	61.5	8	2.0	1	59.5	42.4	15.8	1.75	1.04	29	28	W.	29	W.	2,432
Feb	27.185	27.195	27.179	27.186	27.576	27	26.871	17	1.205	25.0	35.4	31.7	30.7	57.0	24	—8.5	12	65.5	39.5	22.0	1.32	.39	4, 5	25	SE.	17, 19	NW.	3,151
Mar	27.069	27.069	27.047	27.062	27.426	13	26.444	9	.982	37.9	48.3	44.2	43.5	58.9	18	28.8	8	30.1	52.3	36.3	2.78	.49	22, 23	23	NW.	10	SE.	4,870
Apr	27.076	27.087	27.058	27.074	27.375	7	26.724	27	.651	43.8	58.8	53.4	52.0	71.5	9	36.2	1	35.3	62.1	42.6	.78	.34	13, 14	28	SE.	9	NW.	3,855
May	27.140	27.140	27.100	27.127	27.423	7	26.809	20	.614	51.8	68.7	62.9	61.1	83.0	8	35.4	4	47.6	72.7	50.2	.92	.22	26, 27	23	NW.	8	NW.	3,670
June	27.120	27.110	27.080	27.103	27.374	17	26.869	25	.505	58.8	74.6	67.9	67.1	94.8	19	48.0	27	46.8	79.3	57.0	3.41	.80	22, 23	26	S.	8	SE.	3,254
July	27.147	27.155	27.108	27.137	27.430	8	26.870	5	.560	58.4	78.0	71.8	69.4	91.7	25	47.7	8	44.0	82.5	57.3	.60	.44	15, 16	33	NW.	12	NW.	3,236
Aug	27.174	27.161	27.111	27.149	27.409	29	26.888	17	.521	61.5	83.2	76.1	73.6	94.8	30	51.8	29	43.0	87.2	60.1	.07	.07	19	20	NW.	18	NW.	2,839
Sept	27.172	27.155	27.110	27.146	27.406	16	26.670	30	.736	47.1	61.4	55.3	54.6	79.7	1	34.7	29	45.0	65.2	45.5	2.11	.63	14	21	{NW., W.}	1, 25	W.	2,712
Oct	27.238	27.232	27.208	27.226	27.553	16	26.556	1	.997	43.2	58.5	52.1	51.3	77.4	12	29.8	7	47.6	62.2	41.5	1.52	.51	13	25	NW.	1	SE.	3,556
Nov	27.363	27.353	27.337	27.351	27.618	30	26.971	21	.647	33.6	47.4	39.8	40.3	62.3	6	23.7	23	38.6	51.3	32.2	.12	.12	16	13	NW.	26	W.	1,503
Dec	27.112	27.107	27.099	27.106	27.671	31	26.553	26	1.118	23.6	32.3	28.5	28.1	47.7	19	—7.3	31	55.0	37.3	21.1	5.67	1.71	16, 17	19	W.	23	SE.	2,5[illegible]9
Sums ..	326.188	326.127	325.797	326.039	......	...	......	...	9.649	501.7	681.6	615.7	599.7	....	....	......	....	558.0	734.0	481.6	21.05	......	......	..	....	.....	......	37,107
Means .	27.182	27.177	27.150	27.170	27.895	*1	26.871	†17	.804	41.8	56.8	51.3	50.0	94.8	{‡19 §30}	—8.5	†12	46.5	61.2	40.1	.....	......	......	..	....	.....	NW.	......

* January. † February. ‡ June. § August.

BOISÉ CITY, IDAHO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	8	0	4	14	6	15	28	18	0	14.4	27.8	26.4	22.9	88.7	75.1	79.5	81.1	3.2	5.3	4.4	4.3	15	6	10	7	2	30	0	0	0
Feb	10	1	2	18	13	11	5	20	7	21.4	26.4	26.1	24.6	86.6	71.0	80.6	79.4	5.5	6.2	4.3	5.3	10	8	11	11	8	19	0	0	0
Mar	7	4	6	27	8	3	11	19	8	32.0	33.2	34.9	33.4	79.8	57.2	70.4	69.1	6.3	6.4	5.0	5.9	7	13	11	19	0	6	0	0	0
Apr	7	6	10	17	6	6	4	29	5	35.0	38.7	40.4	38.0	71.7	48.2	62.3	60.7	3.9	5.1	4.2	4.4	10	15	5	9	0	0	0	0	0
May	7	3	9	11	11	5	9	34	4	43.0	52.8	50.7	48.8	72.7	58.1	65.5	65.4	3.1	3.4	3.6	3.4	16	13	2	11	0	0	0	4	0
June	2	6	11	25	4	1	14	20	7	49.2	54.9	53.3	52.5	71.5	52.1	61.2	61.6	4.6	4.6	4.5	4.6	10	13	7	17	0	0	2	7	0
July	4	7	12	11	6	2	8	37	6	49.2	56.8	54.6	53.5	72.5	49.2	56.1	59.3	2.1	2.4	1.3	1.9	23	7	1	3	0	0	3	2	0
Aug	7	9	8	14	7	4	14	19	11	49.0	54.8	53.7	52.5	64.2	38.2	46.4	49.6	1.8	1.1	1.7	1.5	26	5	0	1	0	0	12	0	0
Sept	3	6	8	12	4	1	24	22	10	40.5	41.6	42.1	41.4	78.5	50.9	63.5	64.3	4.1	4.6	3.6	4.1	13	10	7	7	0	0	0	0	0
Oct	3	2	10	24	6	4	18	19	7	35.9	35.2	38.1	36.4	76.2	43.2	61.2	60.2	4.2	3.6	3.6	3.8	13	14	4	5	0	2	0	2	0
Nov	9	8	8	12	1	0	21	16	15	30.4	32.1	33.4	32.0	88.0	55.8	78.1	74.0	2.8	3.7	2.0	2.8	16	12	2	1	0	13	0	0	0
Dec......	2	2	8	29	4	2	19	20	7	20.7	23.3	24.1	22.7	88.0	69.3	83.6	80.3	5.8	6.2	6.0	6.0	9	7	15	17	7	29	0	0	0
Sums ..	69	54	96	214	76	54	175	273	87	420.7	477.6	477.8	458.7	938.4	668.3	808.4	805.0	47.4	52.6	44.2	48.0	168	123	75	108	17	99	17	15	0
	Percentages.																					Percentages.								
Means .	6.3	4.9	8.7	19.5	6.9	4.9	15.9	24.9	7.9	35.1	39.8	39.8	38.2	78.2	55.7	67.4	67.1	4.0	4.4	3.7	4.0	45.9	33.6	20.5	29.5	4.6	27.0	4.6	4.1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.24 a. m., 12.24 p. m., and 8.24 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, +.014 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.960; March, 2.920; April, 2.840; May, 2.840; June, 2.780; July, 2.720; August, 2.750; September, 2.770; October, 2.860; November, 2.940; December, 2.980.

REMARKS.—February, one foggy day; March 26, last snow-fall; May 4, last frost; May 11, flood of Boisé River carried away section of bridge; June, thunder-storms and lightning very frequent and precipitation excessive; July 28, zodiacal light in evening; September 3, first frost (light); September 25, first killing frost and ice; October 13, unusually severe electrical disturbance, with sleet and heavy rain; December 15–17, very heavy snow-storm; monthly precipitation excessive.

JAMES KENEALY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BOSTON, MASS.

Location of office on December 31, 1884, post-office and sub-treasury building.

[Latitude, 42° 21′ N.; longitude, 77° 4′ W. Elevation of barometer above sea-level, 122 feet. Elevation of exposed thermometer above ground, 116 feet. Elevation of rain-gauge above ground, 174 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only). Washington time. 7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Temperature. Washington time. 7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Self-registering thermometers. Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Precipitation. Total amount.	Any 3 consecutive 8-hourly measurements. Largest amount.	Date.	Wind. Maximum hourly velocity during month. Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.977	29.938	29.949	29.955	30.674	27	28.972	2	1.702	20.2	27.8	23.8	23.8	52.2	9	− 0.5	6	52.7	32.0	16.8	6.27	2.14	9	48	SE.	9	NW.	8,674
Feb	29.949	29.865	29.945	29.920	30.643	16	28.839	28	1.804	29.1	33.9	30.0	31.0	59.0	14	3.0	29	56.0	39.1	23.1	5.74	1.36	23	44	SE.	20	NW.	7,590
Mar	29.869	29.826	29.849	29.848	30.308	11	29.308	27	1.000	29.4	38.2	33.0	33.5	60.5	24	*4.5	1	56.0	42.2	*26.2	4.86	1.73	19, 20	36	NW.	30	NW.	8,754
Apr	29.674	29.648	29.679	29.667	30.040	27	28.796	3	1.244	40.3	46.2	41.7	42.7	69.0	16	27.0	1	42.0	50.8	36.7	4.76	1.45	2, 3	29	NE.	9	NW.	7,995
May	29.814	29.766	29.810	29.797	30.179	31	29.328	10	.851	52.0	58.3	51.0	53.8	87.5	24	35.0	30	52.5	64.2	45.6	3.31	.87	20	36	NE.	7	W.	7,795
June ..	29.978	29.931	29.940	29.950	30.444	15	29.591	25	.853	63.2	71.7	63.1	66.0	92.6	21	42.0	2	50.6	77.9	56.6	4.01	2.78	25, 26	23	E.	22	W.SW.	6,339
July	29.707	29.666	29.691	29.688	29.938	4	29.394	14	.544	65.3	73.6	65.2	68.0	90.3	2	53.6	28	36.7	77.4	60.1	4.23	.93	29, 30	24	E.	29	W.SW.	6,808
Aug	29.935	29.895	29.919	29.916	30.210	25	29.581	1	.629	65.8	73.2	65.8	68.3	94.3	18	51.0	25	43.3	77.6	61.8	5.01	1.93	7, 8	34	NW.	24	SW.	5,722
Sept. ..	29.969	29.910	29.944	29.941	30.330	14	29.575	18	.755	61.3	72.9	63.2	65.8	94.4	10	40.5	14	53.9	76.6	57.2	.81	.09	11	25	N.	18	SW.	6,101
Oct	29.988	29.921	29.962	29.957	30.448	26	29.511	17	.937	49.3	57.5	50.2	52.3	83.3	1	30.6	26	52.7	61.5	43.8	3.17	1.58	30, 31	35	SW.	22	SW.	9,288
Nov	29.904	29.874	29.889	29.889	30.343	22	29.190	29	1.153	37.2	46.0	40.0	41.1	65.1	23	21.5	25	43.6	50.0	32.6	3.08	1.27	28, 29	47	S.	28	W.	8,732
Dec......	30.005	29.964	29.961	29.977	30.603	27	29.332	7	1.271	29.8	36.1	33.5	33.1	62.1	31	− 9.5	20	71.6	41.3	26.3	4.46	1.35	21, 22	44	S.	21	W.SW.	8,730
Sums ..	358.769	358.201	358.538	358.505	....	...	....	...	12.743	542.9	634.9	560.5	579.4	......	...	......	...	611.6	690.6	486.2	49.18	.....	......	...	....	...	....	92,528
Means .	29.897	29.850	29.878	29.875	30.674	†27	28.796	‡3	1.062	45.2	52.9	46.7	48.3	94.4	§10	− 9.5	‖20	51.0	57.6	40.5	......	.....	......	...	....	...	SW.	......

*For 30 days. †January. ‡April. §September. ‖December.

BOSTON, MASS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	3	1	2	3	21	23	31	0	12.9	18.3	17.2	16.1	73.5	70.2	76.1	73.3	6.0	6.2	6.1	6.1	8	11	12	13	14	30	0	0	0
Feb	6	17	9	4	5	14	9	22	1	25.5	29.4	26.1	27.0	86.7	83.9	85.4	85.3	8.4	8.2	6.5	7.7	1	10	18	13	3	24	0	0	1
Mar	11	8	4	4	4	10	20	32	0	23.9	28.6	28.0	26.8	80.0	69.7	82.6	77.4	7.5	7.2	4.8	6.5	6	11	14	18	5	*18	0	0	5
Apr	11	15	14	2	3	2	10	33	0	36.2	38.2	37.3	37.2	86.9	76.5	85.2	82.9	6.5	6.9	6.2	6.5	7	6	17	17	0	5	0	0	0
May	3	9	6	14	7	15	21	18	0	45.3	46.7	45.0	45.7	78.9	69.7	81.6	76.7	5.1	6.1	3.7	5.0	8	17	6	11	0	0	0	4	1
June	4	12	10	6	4	23	23	7	1	56.0	57.7	56.8	56.8	78.6	64.4	80.6	74.5	2.9	3.7	1.9	2.8	18	9	3	7	0	0	4	3	2
July	5	5	7	9	5	22	22	18	0	58.9	59.7	60.2	59.6	80.7	63.6	84.8	76.4	5.4	5.7	5.4	5.5	7	13	11	17	0	0	1	5	0
Aug	8	6	2	15	10	26	14	11	1	61.5	63.9	63.1	62.8	86.9	75.0	91.6	84.5	6.1	5.2	4.9	5.4	7	15	9	14	0	0	1	1	0
Sept	4	3	3	9	4	31	17	16	3	53.6	56.1	56.6	55.4	76.4	57.5	79.6	71.2	3.0	3.8	3.5	3.4	15	13	2	8	0	0	4	3	1
Oct	4	6	7	3	3	26	22	22	0	40.4	40.5	41.6	40.8	72.2	56.2	73.5	67.3	4.5	5.5	5.0	5.0	10	11	10	13	0	2	0	1	0
Nov	11	2	3	1	8	23	28	14	0	31.1	31.0	32.3	31.5	78.9	58.2	74.9	70.7	5.6	4.9	3.5	4.7	10	12	8	9	0	13	0	0	0
Dec	12	1	2	2	8	23	23	22	0	22.9	24.0	25.6	24.2	75.6	63.7	73.2	70.8	6.0	6.3	5.8	6.0	6	12	13	18	7	17	0	0	0
Sums ..	88	87	68	71	64	236	232	246	6	468.2	494.1	489.8	483.9	955.3	808.6	969.1	911.0	67.0	69.2	57.7	64.6	103	140	123	158	29	109	10	17	10
	Percentages.																					Percentages.								
Means.	8.0	7.9	6.2	6.5	5.8	21.5	21.1	22.4	0.5	39.0	41.2	40.8	40.3	79.6	67.4	80.8	75.9	5.6	5.8	4.8	5.4	28.1	38.3	33.6	43.2	7.9	29.8	2.7	4.6	2.7

*30 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.24 a. m., 3.24 p. m., and 11.24 p. m., local time.

Correction for instrumental error of barometer used: From January 1 to December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.140; February, 0.140; March, 0.140; April, 0.140; May, 0.140; June, 0.130; July, 0.130; August, 0.130; September, 0.140; October, 0.130; November, 0.130; December, 0.130.

REMARKS.—The elevation of instruments was changed as follows on October 1, 1884: Old elevation: Barometer, 142.19 feet; exposed thermometer, 155.41 feet; web bulb thermometer, 155.58 feet; maximum thermometer, 155.82 feet; minimum thermometer, 166.02 feet; rain-gauge, 161.59 feet; anemometer, 177.67; anemoscope, 177.67. New elevation: Barometer, 124.88 feet; exposed thermometer, 116.29 feet; wet bulb thermometer, 116.38 feet; maximum thermometer, 116.63 feet; minimum thermometer, 117.75 feet; rain-gauge, 173.97 feet; anemometer, 181.00 feet; anemoscope, 183.83 feet.

OTTO B. COLE,
Sergeant, Signal Corps, U. S. A.

Meterological summary for the year ending December 31, 1884—Continued.

BROWNSVILLE, TEX.

Location of office on December 31, 1884, corner Elizabeth and Fourteenth streets.

[Latitude, 25° 53′ N.; longitude, 97° 26′ W. Elevation of barometer above sea-level, 57 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.183	30.159	30.203	30.182	30.645	20	29.689	23	.956	47.4	60.1	51.9	53.1	80.0	14	24.8	6	55.2	63.8	44.2	1.10	.75	15, 16	41	S.	10	N.	6,963
Feb	29.978	29.976	30.015	29.987	30.360	14	29.664	13	.705	59.7	73.0	61.8	64.8	84.6	13	33.0	{14 {15	}51.6	75.6	56.7	.—	.—	29	36	SE.	4	SE.	8,464
Mar	29.906	29.878	29.917	29.900	30.235	14	29.626	24	.609	64.2	77.2	67.4	69.6	92.3	7	35.6	1	56.7	79.7	62.0	.07	.03	13	34	S.	5	S.	8,166
Apr	29.850	29.830	29.868	29.849	30.156	23	29.513	14	.643	66.1	79.8	69.4	71.8	95.2	19	47.0	22	48.2	82.8	64.1	.57	.34	4	35	SE.	26	SE.	8,201
May	29.860	29.845	29.881	29.862	30.123	9	29.689	21	.434	71.3	84.4	74.4	76.7	92.0	22	57.8	8	34.2	87.0	69.8	5.86	2.69	7	29	NE.	4	SE.	6,382
June	29.876	29.869	29.881	29.875	29.998	28	29.778	25	.220	74.4	86.8	78.2	79.8	94.3	14	67.3	5	27.0	89.9	73.0	2.74	1.75	23	24	E.	27	SE.	4,459
July	29.900	29.884	29.903	29.896	29.988	6	29.798	16	.190	77.4	90.5	80.6	82.8	95.8	10	74.0	21	21.8	92.2	77.2	.23	.13	13	26	S.	30	S.	7,307
Aug	29.922	29.902	29.928	29.917	30.031	3	29.825	12	.206	74.8	90.0	78.9	81.2	95.0	12	68.0	9	27.0	92.2	74.4	.88	.44	27	25	SE.	19	SE.	4,884
Sept	29.878	29.854	29.893	29.875	30.065	20	29.729	8	.336	75.3	87.2	78.8	80.3	96.0	2	69.3	1	26.7	89.6	74.5	8.96	3.08	19, 20	28	S.	27	S.	4,822
Oct	29.968	29.953	29.991	29.971	30.148	16	29.826	2	.322	69.4	78.9	72.3	73.5	88.0	8	57.0	28	31.0	82.8	68.8	15.71	4.86	27, 28	25	NE.	24	N.	3,934
Nov	30.055	30.025	30.080	30.053	30.372	6	29.689	22	.683	60.3	72.2	64.0	65.5	83.0	22	48.0	30	35.0	74.9	58.8	3.46	1.23	1, 2	24	SW.	29	N.	4,532
Dec	29.943	29.935	29.974	29.951	30.325	18	29.623	4	.702	56.6	65.3	58.8	60.2	82.6	11	30.0	26	52.6	70.3	52.5	1.33	.90	9	27	S.	6	N.	6,061
Sums ..	359.319	359.101	359.534	359.318	....	...	....	...	6.006	796.9	945.4	836.0	859.3	.....	...	......	...	406.5	980.8	775.5	40.91	....	......	...	....	....	....	74,175
Means .	29.943	29.925	29.961	29.943	30.645	*20	29.513	†14	.500	66.4	78.8	69.7	71.6	96.0	‡2	24.8	*6	33.9	81.7	64.6	.....	....	......	...	....	....	SE.	......

* January. † April. ‡ September.

BROWNSVILLE, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	30	9	13	8	18	0	4	3	8	41.4	43.3	45.9	43.5	80.8	57.7	81.8	73.4	4.0	5.9	4.1	4.7	8	18	5	5	0	5	0	0	0
Feb	12	9	7	41	13	2	1	0	2	56.4	55.7	57.2	56.4	89.4	56.2	85.6	77.1	4.4	4.6	4.0	4.3	11	12	6	0	0	0	0	0	0
Mar	14	18	5	12	32	2	3	3	4	62.1	60.4	63.8	62.1	93.2	58.9	89.0	80.4	6.8	5.2	5.1	5.7	7	11	13	3	0	0	1	0	0
Apr	11	10	13	25	19	2	0	7	3	63.6	60.3	64.2	62.7	91.7	54.5	84.2	76.8	6.5	4.5	5.5	5.5	9	10	11	4	0	0	3	0	0
May	5	15	18	26	15	1	0	3	10	69.5	67.8	70.9	69.4	94.5	59.1	89.4	81.0	6.2	5.9	4.4	5.5	9	11	11	11	0	0	3	6	0
June	2	11	23	29	9	1	0	1	14	72.8	70.9	73.2	72.3	95.1	60.6	84.8	80.2	4.5	6.1	1.9	4.2	7	21	2	8	0	0	17	5	0
July	0	0	12	30	42	2	0	0	7	75.2	72.2	75.7	74.4	93.0	55.4	85.6	78.0	2.5	3.7	0.7	2.3	18	13	0	3	0	0	28	0	0
Aug	5	13	20	29	6	0	0	0	20	72.9	69.6	73.4	72.0	94.1	51.6	83.3	76.3	2.5	6.0	1.3	3.3	17	12	2	4	0	0	27	6	0
Sept	3	17	20	18	25	1	0	0	6	73.8	72.8	74.6	73.7	95.6	64.2	88.8	82.9	3.0	6.7	2.7	4.1	13	13	4	13	0	0	12	7	0
Oct	23	13	12	10	4	4	0	3	24	67.9	70.2	69.9	69.3	95.3	76.1	92.1	87.8	5.0	8.4	4.1	5.8	7	14	10	17	0	0	0	5	0
Nov	40	8	7	4	9	3	0	4	15	57.4	60.2	59.8	59.1	90.5	67.6	86.8	81.6	5.2	7.0	4.7	5.6	9	10	11	10	0	0	0	2	0
Dec	29	5	4	4	26	6	5	6	8	54.1	55.4	55.1	54.9	91.8	73.0	88.3	84.4	5.1	6.1	5.4	5.5	5	19	7	10	0	2	0	1	0
Sums ..	174	128	154	236	218	24	13	30	121	767.1	758.8	783.7	769.8	1105.0	734.9	1039.7	959.9	55.7	70.1	43.9	56.5	120	164	82	88	0	7	91	32	0
	Percentages.																					Percentages.								
Means	15.9	11.7	14.0	21.5	19.9	2.2	1.1	2.7	11.0	63.9	63.2	65.3	64.1	92.1	61.2	86.6	80.0	4.6	5.8	3.7	4.7	32.8	44.8	22.4	24.0	0	1.9	24.9	8.8	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time.
Correction for instrumental error of barometer used: From 5.38 a. m., January 1, to 9.38 p. m., December 31, 1884, inclusive, +.002 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .060; February, .060; March, .060; April, .060; May, .060; June, .060; July, .060; August, .060; September, .060; October, .060; November, .060; December, .060.

JNO. McGLONE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BUFFALO, N. Y.

Location of office on December 31, 1884, Board of Trade building.

[Latitude, 42° 53′ N.; longitude, 78° 53′ W. Elevation of barometer above sea-level, 690 feet. Elevation of exposed thermometer above ground, 161 feet. Elevation of rain-gauge above ground, 108 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.337	29.295	29.317	29.316	30.051	27	28.574	2	1.477	16.7	19.6	17.7	18.0	45.7	30	—13.5	25	59.2	25.2	10.6	3.36	.75	8, 9	59	W.	8	SW.	12,224
Feb	29.268	29.264	29.270	29.267	29.843	15	28.554	19	1.289	25.2	28.1	25.6	26.3	55.0	19	— 7.4	29	62.4	36.3	18.4	4.03	.63	27, 28	52	W.	21	NE., W.	8,391
Mar	29.263	29.248	29.260	29.257	29.633	16	28.710	26	.923	27.1	32.2	28.7	29.3	60.9	25	— 2.0	1	62.9	36.8	22.4	2.84	1.05	11, 12	60	SW.	12	SW.	8,009
Apr	29.167	29.134	29.161	29.154	29.624	21	28.463	2	1.161	36.3	43.9	38.9	39.7	71.8	27	26.2	6	45.6	47.9	32.7	1.56	.51	15, 16	29	SW.	28	SW.	6,144
May	29.181	29.166	29.177	29.175	29.505	8	28.853	2	.652	50.1	55.0	51.2	52.1	76.9	22	35.8	8	41.1	60.8	44.7	3.92	.67	7	58	SW.	2	SW.	7,477
June	29.351	29.317	29.322	29.330	29.711	15	28.957	9	.754	63.3	72.2	64.1	66.5	85.1	22	47.9	15	37.2	75.4	58.0	2.80	1.40	10, 11	32	NE.	26	SW.	5,084
July	29.145	29.118	29.127	29.130	29.311	8	28.815	31	.496	62.6	68.0	64.2	64.9	88.5	8	50.0	14	38.5	71.8	58.7	5.11	1.10	4	44	SW.	23	SW.	6,185
Aug	29.298	29.270	29.283	29.284	29.590	9	28.861	29	.729	63.8	73.1	65.7	67.5	87.8	16	46.3	25	41.5	75.8	60.3	4.56	2.39	28, 29	36	SW.	23	SW.	6,180
Sept	29.349	29.306	29.325	29.327	29.787	14	28.916	28	.871	62.6	70.5	63.8	65.6	88.1	10	40.0	14	48.1	72.6	58.4	1.77	.84	24, 25	44	SW.	28	SW.	7,051
Oct	29.394	29.359	29.360	29.371	29.787	25	28.946	8	.841	49.4	55.1	51.5	52.0	72.5	4	24.7	26	47.8	59.3	44.7	1.54	.34	27	42	W.	22	SW.	8,908
Nov	29.294	29.257	29.296	29.282	29.663	8	28.661	23	1.002	36.0	41.1	36.6	37.9	61.0	10	10.6	24	50.4	44.8	31.6	2.51	.69	23	60	W.	23	W.	9,979
Dec	29.340	29.317	29.343	29.333	29.920	26	28.548	6	1.372	28.9	31.3	29.1	29.8	57.9	30	— 3.5	19	61.4	35.7	24.0	3.07	.82	6, 7	64	SW.	15	SW.	10,855
Sums	351.387	351.051	351.241	351.226	....	...	....	...	11.567	522.0	590.1	537.1	549.6	....	....	......	...	591.1	642.4	464.5	37.07	...	......	...	....	....	....	96,573
Means	29.282	29.254	29.270	29.269	30.051	*27	28.463	†2	.964	43.5	49.2	44.8	45.8	88.1	‡10	—13.5	*25	49.3	53.5	38.7	.....	....	......	...	....	....	SW.	......

* January. † April. ‡ September.

BUFFALO, N. Y.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	8	8	3	4	10	36	22	2	0	13.6	15.3	13.2	14.0	87.1	83.2	82.3	84.2	8.8	8.5	8.2	8.5	1	7	23	20	21	31	0	0	0
Feb	8	21	4	10	7	17	21	4	0	21.6	22.6	21.8	22.0	85.8	80.5	85.6	84.0	9.2	8.6	7.3	8.4	0	9	20	22	7	25	0	0	0
Mar	8	17	5	4	10	27	11	11	0	21.5	24.8	23.8	23.4	80.0	74.7	81.9	78.9	5.7	6.0	5.5	5.7	4	19	8	16	11	27	0	2	1
Apr	6	18	8	3	7	25	12	9	2	31.2	32.8	32.6	32.2	82.1	68.1	79.9	76.7	6.4	6.2	4.5	5.7	8	10	12	10	0	14	0	0	0
May	4	7	12	4	14	32	14	4	2	42.5	44.6	44.8	43.8	76.8	70.1	78.6	75.0	5.4	7.6	4.0	5.7	4	18	9	16	0	0	0	2	0
June	0	18	11	5	15	33	7	1	0	55.4	55.0	56.5	55.6	76.1	58.0	77.4	70.5	3.8	3.4	1.9	2.9	17	11	2	10	0	0	0	3	0
July	4	2	4	3	10	41	17	6	6	56.3	57.8	57.2	57.1	80.3	70.8	78.7	76.6	5.5	5.8	5.4	5.6	6	17	8	13	0	0	0	5	0
Aug	4	5	10	5	25	27	9	6	2	56.0	58.3	57.1	57.4	79.2	61.5	74.6	71.8	3.9	3.7	3.0	3.5	16	11	4	9	0	0	0	2	0
Sept	6	6	8	3	21	27	12	6	1	58.6	62.2	59.5	60.1	87.7	76.0	86.6	83.4	4.1	3.8	4.1	4.0	12	13	5	10	0	0	0	1	0
Oct	8	3	9	2	17	24	23	6	1	45.2	47.4	46.7	46.4	85.6	76.3	84.0	82.0	5.6	6.7	4.7	5.7	7	14	10	17	0	4	0	0	0
Nov	5	5	5	4	15	22	29	5	0	32.3	34.9	32.0	33.1	86.3	78.6	83.7	82.9	8.0	7.6	6.4	7.3	5	7	18	13	2	13	0	0	0
Dec	2	8	14	11	15	22	20	1	0	25.6	27.0	23.9	26.2	87.4	84.1	87.6	86.4	8.8	7.8	8.2	8.3	1	8	22	18	10	22	0	0	0
Sums	58	118	93	58	166	333	197	61	14	460.7	482.7	470.6	471.3	993.9	881.9	980.9	952.4	74.7	75.7	63.2	71.8	81	144	141	174	51	136	0	15	1
	Percentages.																					Percentages.								
Means	5.3	10.7	8.5	5.3	15.1	30.3	17.9	5.6	1.3	38.4	40.2	39.2	39.3	82.8	78.5	81.7	79.3	6.2	6.3	5.8	5.9	22.1	39.3	38.5	47.5	13.9	37.2	0	4.1	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.53 a. m., 2.53 p. m., and 10.53 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, 1884, to 11 p. m., February 24, 1884, inclusive, +.007 inch; from 3 a. m., February 25, 1884, to 11 a. m., September 10, 1884, inclusive, +.012 inch (by order Lieut. Powell, inspector); from 3 p. m., September 10, 1884, to 11 p. m., December 31, 1884, inclusive, +.007 inch (approved C. S. O., September 17, 1884).

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .790; February, .790; March, .780; April, .770; May, .740; June, .730; July, .720; August, .720; September, .730; October, .750; November, .770; December, .790.

REMARKS.—Last frost of season, March 28; first frost of season, September 19; aurora, March 28, from 8.10 p. m. to 10 p. m.

D. CUTHBERTSON,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BUFORD, FORT, DAK.

Location of office on December 31, 1884, Post building.

[Latitude, 48° 0′ N.; longitude, 103° 56′ W. Elevation of barometer above sea-level, 1,930 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.047	28.031	28.045	28.041	28.700	4	27.422	31	1.278	2.1	11.8	5.0	6.3	46.0	12	—41.0	4	87.0	17.1	— 6.6	.11	.05	9	42	NW.	9	W.	6,989
Feb	28.006	28.022	28.047	28.025	28.603	10	27.237	18	1.366	—3.5	4.6	—0.9	0.1	45.0	24	—40.0	11	85.0	9.4	—11.2	.12	.03	2	40	NW.	29	W.	7,180
Mar	27.934	27.917	27.926	27.926	28.235	3	27.376	10	.859	12.2	26.9	19.6	19.6	58.8	25	—22.7	6	81.5	31.6	10.4	.10	.04	30	38	NW.	1, 2	W.	6,282
Apr	27.981	27.958	27.961	27.967	28.501	19	27.468	13	1.033	31.0	47.6	38.1	38.9	76.2	24	11.8	8	64.4	52.4	29.2	1.30	.90	29, 30	34	NW.	6	NE.	7,573
May *	27.941	27.919	27.921	27.927	28.116	29	27.498	3	.618	46.4	67.7	54.3	56.1	85.5	16	25.2	5	60.3	72.2	43.5	.14	.07	1, 30	36	NW.	4	NE. NW.	5,791
June	27.899	27.864	27.862	27.875	28.082	1	27.643	26	.439	60.4	80.2	67.9	69.5	98.9	26	43.8	1	55.1	86.3	56.6	.99	.84	12	40	NW.	10	N.E.	7,130
July	27.932	27.900	27.904	27.912	28.118	18	27.534	31	.584	55.7	73.2	63.1	64.0	93.2	31	37.5	3	55.7	79.2	52.8	1.87	.94	16, 17	40	E.	16	W.	7,839
Aug	27.945	27.911	27.919	27.925	28.201	3	27.590	31	.611	54.3	79.6	65.7	66.5	100.5	14	43.5	3	57.0	84.6	53.2	1.06	.57	17	44	NW.	1	NW.	6,269
Sept	27.851	27.830	27.865	27.849	28.235	19	27.461	27	.774	44.2	62.2	50.8	52.4	80.0	20	28.1	30	51.9	65.9	41.6	.53	.32	7	46	W.	8	W.	7,516
Oct	27.941	27.902	27.926	27.923	28.318	22	27.525	18	.793	35.5	54.7	43.4	44.5	85.9	18	14.3	27	71.6	59.9	32.4	.44	.24	31	48	NW.	25	W.	7,320
Nov	28.029	28.022	28.035	28.029	28.387	16	27.527	26	.860	23.4	37.0	27.6	29.3	61.9	6	— 9.0	23	70.9	41.5	19.2	.31	.18	28	44	NW.	19	W.	4,977
Dec	28.049	28.047	28.056	28.051	28.489	31	27.499	3	.990	—0.9	6.4	—0.4	1.7	56.8	1	—39.8	22	96.6	10.8	— 6.7	.40	.17	19, 20	34	W.	9	W.	6,062
Sums	335.555	335.343	335.407	335.450	......	...	......	...	10.205	360.8	551.9	434.2	448.9	......	...	......	..	837.0	610.9	314.4	7.87	....	......	...	....	....	....	80,428
Means	27.963	27.944	27.956	27.954	28.700	†4	27.237	‡18	.850	30.1	45.9	36.2	37.4	100.5	§14	—41.0	†4	69.8	50.9	26.2	....	....	......	...	....	....	W.	......

* Four 7 a. m., five 3 p. m. and five 11 p. m. observations missed.

† January.

‡ February.

§ August.

BUFORD, FORT. DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	11	5	8	3	8	12	28	17	1	0.2	7.7	1.7	3.2	91.7	84.8	87.1	87.9	4.9	6.5	4.5	5.3	5	18	8	5	24	31	0	0	1
Feb	12	15	6	4	4	3	24	15	4	-6.4	-2.4	-6.5	-5.1	87.2	75.6	79.5	80.8	6.1	7.0	4.7	5.9	3	19	7	8	25	29	0	0	0
Mar.	9	16	13	4	8	6	19	18	0	9.2	19.3	16.3	14.9	87.2	73.8	86.9	82.6	5.4	4.8	3.7	4.6	9	16	6	6	13	28	0	0	4
Apr.	11	23	14	14	3	2	7	15	1	26.9	31.8	29.2	29.3	85.3	58.3	72.7	72.1	6.2	6.0	4.9	5.7	8	14	8	10	2	16	0	0	1
May*	4	15	11	9	13	4	6	15	2	38.9	42.1	38.0	39.7	76.3	41.2	56.3	57.9	5.8	6.1	3.7	5.2	6	14	6	2	0	3	0	0	0
June	6	21	11	18	5	6	16	7	0	53.2	53.1	52.2	52.8	78.1	42.1	59.8	60.0	5.3	4.8	4.8	5.0	8	14	8	10	0	0	12	4	2
July	7	19	17	6	2	7	24	11	0	52.3	51.7	52.5	52.2	88.7	49.1	70.1	69.3	6.3	7.2	6.6	6.7	1	15	15	13	0	0	2	5	0
Aug	10	13	14	9	13	4	13	15	2	48.1	50.8	49.4	49.4	80.5	39.0	58.0	59.2	4.3	5.3	3.1	4.2	12	15	4	9	0	0	10	5	0
Sept	5	13	11	2	6	8	28	12	5	39.5	40.8	40.7	40.3	84.2	48.7	70.2	67.7	6.8	8.3	5.0	6.7	1	17	12	5	0	1	0	1	2
Oct	2	7	7	9	14	8	25	19	2	28.2	31.6	31.8	30.5	75.5	46.6	66.1	62.7	5.2	6.9	5.8	6.0	5	16	10	6	1	14	0	0	2
Nov	7	15	5	3	14	6	21	16	3	19.6	26.1	21.8	22.5	85.4	66.6	79.0	77.0	5.6	6.4	4.7	5.6	7	14	9	4	7	29	0	0	0
Dec	5	7	10	5	7	6	35	18	0	-6.0	-1.3	-6.0	-4.4	77.4	71.2	76.0	74.9	5.0	6.8	4.8	5.5	5	19	7	7	23	30	0	0	0
Sums	89	169	127	86	97	72	246	178	20	303.7	351.3	321.1	325.3	996.5	697.0	861.7	852.1	66.9	76.1	56.3	66.4	70	191	100	85	95	181	24	15	12
	Percentages.																					Percentages.								
Means	8.2	15.6	11.7	7.9	8.9	6.6	22.7	16.4	1.8	25.3	29.3	26.8	27.1	83.0	58.1	71.8	71.0	5.6	6.3	4.7	5.5	19.4	52.9	27.7	23.5	26.3	50.1	6.6	4.2	3.3

* Four 7 a. m., five 3 p. m., and five 11 p. m., observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.12 a. m., 1.12 p. m., and 9.12 p. m., local time.

Correction for instrumental error of barometer used: From 5.12 a. m., January 1, to 9.12 p. m., December 31, 1884, inclusive, +.021 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.280; February, 2.210; March, 2.160; April, 2.100; May, 2.000; June, 1.990; July, 1.960; August, 1.980; September, 2.020; October, 2.100; November, 2.160; December, 2.270.

REMARKS.—January, aurora 25th; snow from a cloudless sky 25th. March, aurora 19th, 20th, 21st, 28th. April, frost 1st, 2d, 3d, 8th, 9th, 17th, 19th, 26th. May, frost 1st, 2d, 5th. June, aurora 13th, 18th. September, first frost (light) 9th, 19th, and killing frost 30th; aurora 17th and 18th. October, aurora 9th and 15th; frost 4th, 7th, and 27th. November, frost 3d, 4th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 18th. December, frost 3d, 4th, 5th, 17th.

A. SCHNEIDER.
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CAIRO, ILL.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 37° N.; longitude, 89° 10′ W. Elevation of barometer above sea-level, 377 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.888	29.847	29.889	29.875	30.358	5	29.350	31	1.008	24.0	32.1	27.0	27.9	65.5	30	—16.0	5	81.5	35.4	19.2	2.32	.56	7, 8	38	W.	1	N.	7,119
Feb	29.709	29.661	29.699	29.690	30.096	15	29.105	19	.991	39.2	45.0	41.7	42.0	69.0	4	12.0	14	57.0	49.5	33.8	5.58	1.89	5, 6	42	NW.	19	S. N.	6,946
Mar	29.672	29.625	29.650	29.649	30.042	3	29.131	1	.911	42.9	52.0	48.0	47.6	71.0	28	19.0	8	52.0	54.5	41.0	4.20	1.91	5	42	W.	25	S.	7,583
Apr	29.581	29.557	29.555	29.564	29.809	11	29.030	14	.779	51.7	60.5	56.3	56.2	80.0	30	37.7	10	42.3	63.6	49.3	3.65	1.26	14	48	NW.	2	NW.	7,193
May	29.612	29.587	29.598	29.599	29.874	30	29.322	18	.552	61.0	72.7	65.4	66.4	82.5	10	49.0	2	33.5	74.1	59.0	4.57	1.28	21, 22	34	SW.	10	S.	6,531
June	29.632	29.602	29.608	29.614	29.818	17	29.322	9	.496	70.0	78.7	72.4	73.7	92.0	23	56.0	10	36.0	80.9	67.4	2.95	.81	2	28	SW.	9	S.	4,444
July	29.591	29.562	29.565	29.573	29.779	21	29.375	9	.404	74.1	84.1	76.5	78.2	92.0	3	66.6	14 21	25.4	85.6	70.6	7.34	2.16	5	50	NE.	26	S.	4,255
Aug	29.703	29.670	29.681	29.685	29.873	9	29.398	29	.475	69.7	82.8	73.6	75.4	90.0	28 29	57.0	10	33.0	83.6	67.4	2.74	1.22	27	32	NW.	25	N.	4,112
Sept	29.699	29.670	29.684	29.684	29.875	20	29.427	23	.448	68.4	81.4	72.7	74.2	91.0	8	57.4	18	33.6	82.0	66.8	5.02	2.90	29	29	SW.	17	S.	4,303
Oct	29.797	29.763	29.772	29.777	30.095	23	29.553	26	.542	57.8	71.0	61.7	63.3	88.0	2	38.0	24	50.0	72.8	55.5	1.89	1.07	26, 27	26	NW.	8	S.	4,395
Nov	29.771	29.740	29.750	29.754	30.200	6	29.231	22	.969	42.5	55.3	47.7	48.5	69.5	8	22.2	24	47.3	57.8	41.3	2.41	1.08	22, 23	38	NW.	23	S.	5,433
Dec	29.766	29.723	29.763	29.751	30.243	19	29.139	6	‡1.104	33.4	39.2	35.9	36.2	‡63.6	‡4	—2.2	19	‡65.8	‡43.1	29.7	8.99	2.65	27, 28	33	W.	31	N.	7,095
Sums	356.421	356.007	356.214	356.215	......	..	......	..	‡8.679	634.2	754.8	679.5	680.6	.....	.....	......	...	‡557.4	‡782.4	601.0	51.60	....	......	...	....	....	....	60,489
Means	29.702	29.667	29.684	29.684	30.358	*5	29.030	†14	.723	52.8	62.9	56.6	57.4	92.0	§23 ‖3	—16.0	*5	46.4	65.2	50.1	.....	....	......	...	....	....	S.	......

*January. †April. ‡See L. R. 299, Obs., 1885. §June. ‖July.

CAIRO, ILL.—Continued.

Month	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan …	28	8	3	1	15	18	11	8	6	19.0	23.6	20.9	21.2	81.1	72.8	76.3	76.6	6.3	6.1	5.2	5.9	4	15	12	15	12	23	0	0	35	3	8	23	2	16	12	1	28	2.2
Feb …	24	4	3	2	24	15	4	11	0	33.1	36.2	33.9	34.4	79.2	73.1	73.8	75.4	6.9	6.5	5.7	6.4	6	10	13	16	2	10	0	6	51	10	21 22 24	25	8	1	26	2	45	3.3
Mar ..	20	17	2	10	26	6	2	9	1	35.6	37.7	36.8	36.7	75.9	62.4	67.3	68.5	6.6	6.5	4.8	6.0	8	10	13	15	0	10	0	6	49	7	1	36	2	11	13	5	43	11.9
Apr ..	13	11	4	12	18	7	4	20	1	44.0	43.0	44.0	43.7	76.0	56.0	66.1	66.0	7.0	6.4	5.0	6.1	5	14	11	12	0	0	0	8	47	11	1	37	4	30	10	7	40	4.4
May ..	25	7	4	2	26	7	8	12	2	54.3	54.8	56.8	55.3	79.3	55.3	75.2	69.9	5.4	5.3	3.3	4.7	9	15	7	16	0	0	0	8	38	5	9	21	4	31	17	1	31	6.3
June ..	21	3	8	7	32	3	1	8	7	66.7	67.9	68.6	67.7	89.4	71.4	87.8	82.9	5.5	6.9	3.9	5.4	8	14	8	18	0	0	3	7	26	11	18	20	7	4	6	4	24	1.0
July ..	22	5	4	3	26	10	8	11	4	70.2	72.0	71.5	71.2	88.0	68.2	84.8	80.3	5.3	5.0	2.8	4.4	11	15	5	12	0	0	6	10	23	2	10	15	6	28	7	8	20	7.2
Aug ..	25	5	3	6	20	9	8	15	2	65.2	65.7	66.3	65.7	86.1	57.0	78.5	73.9	2.5	3.9	1.4	2.6	20	10	1	4	0	0	0	4	19	0	4	8	10	28	10	2	13	7.0
Sept ..	11	6	*5	12	*34	14	2	3	3	*64.4	66.2	66.8	*65.8	87.3	61.8	82.4	*77.2	3.9	4.4	2.3	3.5	17	8	5	8	0	0	1	4	14	3	30	7	1	23	7	2	9	1.7
Oct …	13	11	12	4	23	12	7	9	2	53.4	54.0	56.2	54.5	87.0	56.3	82.8	75.4	2.8	3.1	2.5	2.8	19	10	2	6	0	0	0	0	19	8	5	15	9	25	3	11	17	5.1
Nov ..	17	9	0	7	22	14	4	16	1	37.9	41.3	40.9	40.0	83.7	60.3	76.6	73.5	4.1	3.8	3.3	3.7	15	9	6	6	0	3	0	0	15	11	1	9	5	25	6	6	11	8.7
Dec …	18	9	11	15	13	6	4	14	3	28.8	*30.6	30.3	29.9	82.8	72.9	80.2	78.6	7.3	7.1	7.5	7.3	8	11	17	13	7	14	0	0	24	4	31	7	4	9, 10	17	0	13	2.4
Sums .	237	95	*59	81	*279	121	63	131	32	*572.6	*593.0	593.0	*586.1	995.8	767.0	931.8	898.2	63.6	65.0	47.7	58.8	125	141	100	141	21	60	10	48	……		……	……		……	138	1	299	1.2
	Percentages.																					Percentages.																	
Means	21.6	8.7	*5.4	7.4	*25.4	11.0	5.7	11.9	2.9	47.7	49.4	49.4	48.8	83.0	63.9	77.6	74.8	5.3	5.4	4.0	4.9	34.2	38.5	27.3	38.5	5.7	16.4	2.7	13.1	51	10	†21 †22 †24	7	1	‡23	11	6.1	24	11.1

* See L. R. 209, Obs., 1885. † February. ‡ September.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.12 a. m., 2.12 p. m., and 10.12 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.040 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.420; February, 0.420; March, 0.420; April, 0.410; May, 0.400; June, 0.390; July, 0.390; August, 0.390; September, 0.400; October, 0.400; November, 0.420; December, 0.420.

REMARKS.—Mississippi froze over on January 5, temperature 16° below zero, lowest temperature on record. Destructive tornado on February 19. Ice on Mississippi River began breaking up on February 2, and was clear of ice on 4th. Last snowfall March 9. Last frost April 11. First frost October 24. First snowfall November 27. Navigation on Mississippi closed December 18. Cold spell on 19th December, minimum temperature 2.2° below zero.

H. W. FORD,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CANBY, FORT, WASH.

Location of office on December 31, 1884, seventy-five yards east of Cape Disappointment light-house.

[Latitude, 46° 16′ N.; longitude, 124° 4′ W. Elevation of barometer above sea-level, 179 feet. Elevation of exposed thermometer above ground 7 feet. Elevation of rain gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.887	29.903	29.879	29.890	30.312	23	29.201	26	1.111	41.6	43.1	43.0	42.6	55.0	6	32.3	15	22.7	46.6	38.2	6.45	2.17	3	72	SE.	5	E.	11,563
Feb	20.831	29.827	29.810	29.823	30.317	26	29.143	10	1.174	35.1	40.0	39.4	38.2	68.0	29	16.0	11	52.0	44.6	33.0	5.20	1.11	23	64	S.	19	N.	7,714
Mar	20.734	29.735	29.725	29.731	30.124	20	20.216	9	.908	41.3	46.5	44.3	44.0	64.2	14	33.5	6	30.7	50.1	39.9	2.18	.86	24, 25	42	S.	22	W.	5,710
Apr	29.744	29.749	20.740	29.744	30.091	3	29.388	13	.753	48.0	52.8	50.6	50.5	78.2	7	40.9	14	37.3	56.8	45.9	2.98	.92	2	48	SE.	2	W.	7,129
May	20.853	20.858	29.835	29.849	30.095	28	29.603	18	.492	50.7	56.2	53.3	53.4	76.0	18	42.6	5	33.4	59.5	48.5	1.80	.57	4	50	S.	4	W.	6,717
June	29.788	29.802	29.798	29.796	29.977	16 29	29.566	21	.411	52.9	57.3	55.4	55.2	68.0	17	47.6	2	20.4	60.8	51.3	2.16	.78	18, 19	45	SE.	24	W.	6,574
July	29.877	29.890	29.874	29.880	30.023	28	29.625	13	.398	56.0	61.7	58.2	58.6	73.2	26	51.0	17 18	22.2	65.1	54.3	1.73	.65	16	19	S.	5	W.	4,289
Aug	29.834	29.852	29.835	29.840	30.033	28	20.618	2	.415	58.0	64.0	60.1	60.7	90.3	2	50.6	20	39.7	67.5	55.6	1.23	.80	26, 27	34	SE.	13	W.	5,503
Sept	29.804	29.811	29.803	20.806	30.035	26	29.498	7	.557	53.7	57.4	54.8	55.3	64.0	6, 21	42.5	30	21.5	60.2	50.7	6.28	1.41	9, 10	48	SE.	8	S.	6,767
Oct	29.836	29.849	29.836	20.840	30.248	25	29.247	12	1.001	50.5	54.4	52.5	52.5	67.0	16	42.0	14	25.0	57.1	46.8	6.24	1.13	8, 9	56	S.	8, 10	S.	8,868
Nov	29.848	29.856	29.847	29.850	30.151	26	29.579	6	.572	49.2	52.7	50.8	50.9	64.0	12	38.7	22	25.3	55.1	46.8	4.05	1.37	3, 4	53	SE.	23	E.	8,648
Dec.*	29.725	29.743	29.699	29.722	30.237	7	28.874	18	1.363	34.7	38.8	36.4	36.5	54.0	3	21.0	24	33.0	41.7	32.0	5.91	2.77	18, 19	104	E.	16	N.	10,348
Sums ..	357.761	357.875	357.681	357.771	......	...	......	...	9.155	571.7	624.4	598.8	598.4	...	...	......	...	368.2	665.1	543.0	45.71	....	......	...	....	...	....	89,779
Means .	29.813	29.823	29.807	29.814	30.317	†26	28.874	‡18	.763	47.6	52.0	49.9	49.8	90.3	§2	16.0	‖11	30.3	55.4	45.2	.....	....	......	...	....	...	W.	......

* Two 3 p. m. observations missed.

† February.

‡ December.

§ August.

‖ February.

CANBY, FORT, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.									
										Washington time.																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																		*Ft.*	*In.*		*Ft.*	*In.*		*Ft.*	*In.*	*Ft*	*In.*
Jan	9	6	31	29	10	0	5	3	0	36.5	37.6	37.3	37.1	82.6	81.7	81.2	81.8	5.3	6.6	5.3	5.7	8	10	13	16	0	0	0	0	0	22	0	12	14	0	18	8	0	17	9.7
Feb	22	9	13	16	13	7	6	0	1	30.8	35.2	33.5	33.2	79.8	79.7	76.6	78.7	3.7	4.5	3.4	3.9	13	10	6	18	1	12	0	0	0	20	5	24	14	1	3	6	4	17	0.3
Mar	9	5	18	18	18	4	20	2	4	36.8	40.9	39.3	39.0	84.1	81.7	83.7	83.2	3.5	6.1	4.6	4.7	7	19	5	15	0	0	0	0	1	21	8	25	11	8	31	10	0	16	5.7
Apr	13	2	6	14	20	2	25	2	6	44.4	47.0	46.0	45.8	88.0	82.4	84.9	85.1	4.2	6.5	5.0	5.2	7	16	7	14	0	0	0	0	0	21	9	10	11	10	1	9	11	16	3.7
May	25	7	1	3	16	6	30	5	0	45.8	49.3	47.1	47.4	84.0	79.5	80.4	81.3	4.2	5.4	5.3	5.0	8	15	8	7	0	0	0	0	0	20	7	10	11	9	30	8	10	15	7.3
June	17	5	2	5	22	4	24	10	1	50.0	52.5	51.0	51.2	90.0	85.3	85.5	86.9	7.8	6.4	5.8	6.7	2	17	11	14	0	0	0	0	0	21	7	22	12	1	13	9	6	15	8.8
July	23	2	0	4	8	5	41	10	0	52.8	54.5	53.0	53.4	88.9	79.0	83.7	83.9	7.4	7.0	6.6	7.0	1	16	14	12	0	0	0	0	0	19	3	20	12	6	27	6	9	15	4.8
Aug	16	2	2	5	23	2	32	11	0	53.4	57.8	54.5	55.2	85.8	80.5	82.5	82.9	5.7	4.3	4.5	4.8	11	14	6	7	0	0	1	1	0	19	1	19	12	4	12	6	9	15	9.1
Sept	13	4	5	12	29	0	24	8	0	50.7	58.4	51.2	51.8	90.3	87.0	88.2	88.5	4.4	6.1	6.1	5.5	6	15	9	21	0	0	0	2	0	20	6	8, 17	14	0	11	6	6	16	9.8
Oct	14	5	10	6	40	2	13	3	0	47.3	50.6	48.6	48.8	89.7	88.1	87.3	88.4	4.3	5.4	3.8	4.5	15	7	9	19	0	0	0	0	0	20	4	8	14	7	26	5	9	17	8.4
Nov	4	6	35	24	17	2	1	0	1	45.9	47.5	46.6	46.7	89.0	83.5	87.1	86.5	4.0	3.9	3.8	3.9	15	9	6	15	0	0	0	0	0	21	2	3	14	10	24	6	4	17	11.2
Dec[1]	19	18	18	12	2	0	17	5	0	31.4	34.0	32.4	32.6	87.9	86.6	86.4	87.0	5.6	6.2	4.9	5.6	8	10	11	17	5	13	0	0	0	21	10	3	13	9	8	8	1	17	10.9
Sums	184	71	141	143	218	34	238	54	13	525.8	560.3	540.5	542.2	1040.1	995.0	1007.5	1014.2	60.1	68.4	59.1	62.5	101	158	105	170	6	25	1	3	1	......		......	......		......	92	9	200	5.7
	Percentages.																					Percentages.																		
Means	16.8	6.5	12.9	13.0	19.9	3.1	21.7	4.9	1.2	43.8	46.7	45.0	45.2	86.7	82.9	84.0	84.5	5.0	5.7	4.9	5.2	27.7	43.4	28.8	46.4	1.6	6.8	.3	.8	.3	22	0	[2]12	11	8	[3]31	7	9	16	8.5

[1] Two 3 p. m. observations missed.

[2] January.

[3] March.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.52 a. m., 11.52 p. m., and 7.52 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive —.003.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.20; February, 0.20; March, 0.20; April, 0.20; May, 0.20; June, 0.19; July, 0.19; August, 0.19; September, 0.20; October, 0.20; November, 0.20; December, 0.20.

JNO. F. HEMENWAY,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CAPE HENRY, VA.

Location of office on December 31, 1884, 50 yards east of light-house.

[Latitude, 36° 56′ N.; longitude, 76° 0′ W. Elevation of barometer above sea-level, 16 feet. Elevation of exposed thermometer above ground, 15 feet. Elevation of rain-gauge above ground, 6 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a.m.	3 p.m.	11 p.m.							7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.161	30.132	30.139	30.144	30.805	27	29.283	8	1.522	33.6	39.2	36.1	36.3	68.0	24	12.0	5, 6	56.0	44.6	28.5	8.43	1.63	8	50	SE.	8	NW.	11,509
Feb	30.087	30.056	30.101	30.081	30.657	16	29.324	28	1.333	45.8	48.7	45.5	46.7	74.0	6	19.0	29	55.0	55.6	38.9	3.31	.63	20, 23	60	NW.	23	S.	8,906
Mar	30.047	30.001	30.040	30.029	30.448	16	29.472	26	.976	44.7	49.8	45.9	46.8	76.0	26	22.0	1, 4	54.0	54.9	39.2	7.65	1.40	13, 14	52	NW.	31	NW.	10,078
Apr	29.897	29.858	29.902	29.886	30.244	12	29.165	2	1.079	49.7	56.4	49.9	52.0	79.0	29	38.0	12	41.0	59.5	44.9	2.89	1.09	22	40	NW. NE.	9, 22	NW.	9,008
May	29.984	29.943	29.967	29.965	30.319	3	29.673	11	.646	62.4	70.3	62.9	65.2	92.0	2	47.1	30	44.9	73.5	58.2	.78	.31	6, 7	42	SW.	2	SE.	8,360
June	30.064	30.034	30.042	30.047	30.369	15	29.695	9	.674	68.5	76.3	68.4	71.1	89.8	21	51.4	3	38.4	79.2	64.6	2.52	1.21	30	43	NE.	14	SE.	8,919
July	29.909	29.873	29.893	29.892	30.119	22	29.671	13	.448	72.7	80.0	72.2	75.0	96.2	24	62.5	17	33.7	83.4	60.6	7.64	1.89	6	40	NW.	6	S.	8,199
Aug	30.048	30.027	30.038	30.037	30.254	25	29.718	30	.536	72.1	80.4	72.8	75.1	91.8	21	64.9	15	26.9	82.8	69.7	2.56	.92	6, 7	28	N. NE.	7, 12	NE.	8,395
Sept	30.133	30.089	30.117	30.118	30.378	14	29.745	17	.633	69.8	80.9	70.7	73.8	90.5	9	60.5	20	30.0	82.1	67.4	.42	.28	25	41	NE.	14	S.	8,407
Oct	30.167	30.120	30.141	30.143	30.576	26	29.774	8	.802	61.1	69.9	63.6	64.9	86.0	5	39.2	25	46.8	72.8	58.4	.74	.59	22, 23	40	NW.	23	N.	9,722
Nov	30.110	30.064	30.086	30.087	30.425	22	29.429	28	.996	49.7	57.1	52.8	53.2	73.8	2	36.0	25	37.8	61.9	46.6	.58	.28	28	36	NW. N.	5, 16	NE.	8,874
Dec	30.187	30.138	30.161	30.162	30.594	20	29.657	6	.937	41.9	48.1	44.7	44.9	71.8	12	15.3	19	56.5	52.9	38.1	8.49	1.01	21, 22	54	NW.	9	N.	11,185
Sums ..	360.794	360.335	360.627	360.586	....	..	....	...	10.582	672.0	757.1	685.5	705.0	......	..	......	....	521.0	802.7	624.1	41.01	....	......	...	....	....	......	111,562
Means.	30.066	30.028	30.052	30.049	30.805	*27	29.165	†2	.882	56.0	63.1	57.1	58.7	96.2	‡24	12.0	*5, 6	43.4	66.9	52.0	....	....	......	...	....	....	S.	....

* January. † April. ‡ July.

CAPE HENRY, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	16	3	3	3	15	21	7	25	0	28.8	30.3	30.4	29.8	82.9	73.0	79.4	78.4	7.6	5.8	4.1	5.8	7	12	12	15	3	19	0	0	0
Feb	11	6	2	15	17	9	11	13	3	42.1	41.2	40.1	41.1	86.9	76.9	81.9	81.9	5.7	6.0	4.8	5.5	8	13	8	14	1	5	0	0	0
Mar	8	11	5	18	10	10	8	22	1	40.2	39.9	41.3	40.5	84.8	72.5	84.7	80.7	5.3	4.3	3.8	4.5	10	14	7	15	0	4	0	4	0
Apr	10	17	4	13	12	3	11	20	0	42.9	43.1	42.6	42.9	78.6	63.4	77.5	73.2	5.2	6.0	3.4	4.9	11	13	6	7	0	0	0	0	0
May	8	9	13	21	13	15	5	7	2	54.7	55.7	55.0	55.1	77.0	61.8	76.6	71.8	4.0	4.5	3.1	3.9	12	13	6	7	0	0	1	3	0
June	7	17	7	22	20	12	2	0	3	63.1	64.6	63.7	63.8	83.6	68.6	85.1	79.1	4.2	4.7	4.0	4.3	13	9	8	10	0	0	0	2	0
July	10	5	7	8	27	25	0	11	0	66.5	67.0	67.5	67.0	81.8	67.0	85.8	78.2	5.2	4.5	2.6	4.1	13	12	6	14	0	0	1	12	0
Aug	10	33	8	9	20	9	1	2	1	68.4	70.3	68.5	69.1	88.2	73.2	86.5	82.6	5.4	6.1	4.8	5.4	9	11	11	13	0	0	2	3	0
Sept	6	19	7	13	29	11	2	2	1	64.7	65.5	64.9	65.0	84.5	60.7	82.4	75.9	3.4	2.9	0.9	2.4	18	10	2	3	0	0	1	2	0
Oct	19	13	7	12	15	14	2	11	0	54.4	55.3	55.1	54.9	79.5	64.3	75.3	73.0	3.1	3.4	2.4	3.0	18	10	3	5	0	0	0	0	1
Nov	16	18	5	3	15	11	8	10	4	43.1	44.2	44.1	43.8	79.8	63.1	72.9	71.9	4.3	4.0	3.9	4.1	13	10	7	7	0	0	0	0	0
Dec	27	6	0	10	11	16	6	12	5	36.0	38.0	38.1	37.4	80.5	70.6	77.3	76.1	6.1	6.2	5.9	6.1	5	14	12	14	1	6	0	0	0
Sums	148	157	68	147	204	156	63	135	20	604.9	615.1	611.3	610.4	988.1	815.1	965.4	922.8	59.5	58.4	43.7	54.0	137	141	88	124	5	34	5	26	1
	Percentages.																					Percentages.								
Means	13.5	14.3	6.2	13.4	18.6	14.2	5.7	12.3	1.8	50.4	51.3	50.9	50.9	82.3	67.9	80.4	76.9	5.0	4.9	3.6	4.5	37.4	38.5	24.0	33.9	1.4	9.3	1.4	7.1	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.04 a. m., 3.04 p. m., and 11.04 p. m., local time.

Correction for instrumental error of barometer used: From 7.04 a. m., January 1, to 11.04 p. m., December 31, 1884, inclusive, +.016 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, 020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

REMARKS.—January, heavy rains during month. February, lunar halo on 3d, 5th, and 18th. March, lunar halo on 4th; heavy rains during month. May, polar bands on 15th; lunar halo on 2d and 29th. June, meteor fell on 13th; solar halo on 24th. July, lunar halo on 29th; severe thunder-storms during month. August, lunar rainbow on 6th. lunar halo on 5th; three meteors fell on 19th. September, very dry weather during the month; solar halo on 4th, 6th, and 24th; lunar halo on 2d, 3d, 6th, and 28th. October, extremely dry weather during first of month; aurora on 1st from 10 to 11 p. m. November, solar halo on 27th; lunar halo on 25th and 27th. December, distant lightning on 15th; rainbow on 31st; solar halo on 23d; lunar halo on 4th and 31st.

WM. DAVIS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CAPE MAY, N. J.

Location of office on December 31, 1884, Bay Side.

[Latitude, 38° 50′ N.; longitude, 74° 58′ W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 6 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						
Jan	30.139	30.035	30.105	30.110	30.777	27	29.228	9	1.549	30.1	33.5	31.3	31.6	50.5	2	11.0	6	39.5	38.0	24.4	5.56	2.27	8, 9	56	NW.	2	NW.	14,311
Feb	30.055	30.028	30.072	30.052	30.656	16	29.125	28	1.531	37.9	42.3	38.4	39.5	54.0	7, 14	13.0	29	41.0	45.4	32.7	6.22	1.27	28	68	W.	28	NW.	12,396
Mar	30.016	29.954	29.999	29.990	30.421	16	29.448	26	.973	37.9	42.3	39.7	40.0	54.5	29	13.0	1	41.5	45.5	34.0	5.61	1.42	19	72	NW.	30	NW.	12,690
Apr	29.846	29.810	29.845	29.834	30.183	12	29.168	2	1.015	46.0	51.4	47.1	48.2	63.5	29	32.0	3	31.5	54.1	41.8	2.34	0.80	2	78	W.	10	NW.	11,881
May	29.942	29.911	29.926	29.926	30.260	3	29.501	11	.669	57.7	63.8	58.0	59.8	80.0	22	43.0	30	37.0	66.2	53.0	1.19	0.36	6, 7	40	NW.	11	S.	10,323
June	30.048	30.026	30.029	30.034	30.383	15	29.679	26	.704	65.7	72.0	65.1	67.6	86.0	22	49.0	16	37.0	74.5	60.9	1.03	0.56	13, 14	48	NE.	26	S.	9,449
July	29.868	29.826	29.844	29.846	30.012	22	29.616	13	.396	70.0	76.1	71.2	72.4	89.0	23	62.0	16, 17	27.0	78.4	67.1	4.44	1.34	29	38	NW.	14	S.	10,133
Aug	30.031	30.003	20.016	30.017	30.248	25	29.710	30	.538	71.2	76.3	70.6	72.7	85.0	19	57.2	25	28.4	78.2	67.4	5.30	2.73	4, 5	52	S.	22	S.	8,180
Sept	30.107	30.066	30.079	30.084	30.513	14	29.728	17	.785	67.9	75.3	69.4	70.9	84.0	27	47.9	14	36.1	76.8	65.3	0.31	0.29	12	32	S.	16	S.	9,218
Oct	30.144	30.097	30.114	30.118	30.571	26	29.749	8	.822	58.3	63.9	58.8	60.3	85.7	1	36.0	26	49.7	66.8	53.1	1.33	0.73	22, 23	48	NW.	23	S.	11,618
Nov	30.084	30.033	30.046	30.054	30.432	22	29.373	28	1.050	45.5	52.0	47.4	48.3	60.0	2	22.0	25	47.0	55.8	40.9	2.30	0.88	28, 29	56	W.	24	NW.	11,818
Dec	30.165	30.114	30.137	30.139	30.607	20	29.603	6	1.004	38.1	43.4	39.6	40.0	59.0	3	4.6	20	54.4	46.7	33.8	6.87	2.35	21	60	W.	9	N.	12,567
Sums ..	360.445	359.953	360.212	360.204	......	...	....	...	11.045	626.3	691.3	636.6	651.3	....	....	.....	....	470.1	726.4	574.4	42.50	..	......	...	....	....	......	134,584
Means .	30.037	29.996	30.018	30.017	30.777	*27	29.125	†28	.920	52.2	57.6	53.0	54.3	89.0	‡23	4.6	§20	39.2	60.5	47.9	.....	....	......	...	....	....	S.	......

* January. † February. ‡ July. § December.

CAPE MAY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from-								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	11	9	7	2	15	14	5	30	0	24.5	27.5	26.1	26.0	80.1	78.6	81.2	80.0	6.0	7.6	5.0	6.2	6	14	11	16	7	25	0	0	0
Feb	4	13	16	8	16	3	7	20	0	33.7	37.4	33.9	35.0	84.8	83.1	84.0	84.0	6.1	5.2	5.3	5.5	5	16	8	17	1	11	0	1	0
Mar	5	14	9	10	12	1	11	30	1	33.5	36.3	35.1	35.0	84.6	80.4	83.6	82.9	5.1	5.7	4.2	5.0	9	14	8	17	3	8	0	3	0
Apr	7	7	10	8	7	4	16	29	2	39.5	43.8	41.6	41.6	79.1	76.1	81.7	79.0	5.3	5.9	5.7	5.6	5	15	10	11	0	0	0	2	0
May	4	7	4	13	28	9	10	18	0	51.5	52.2	51.1	51.6	81.0	68.8	78.8	76.2	4.3	4.7	4.1	4.4	13	12	6	8	0	0	0	1	0
June	0	18	14	16	25	4	4	7	2	60.3	61.8	60.6	60.9	82.7	71.1	85.5	79.8	4.2	4.2	3.4	3.9	16	7	7	6	0	0	0	0	0
July	4	4	8	10	26	9	10	21	1	64.2	67.4	66.2	65.9	82.6	74.9	85.1	80.9	4.8	4.9	5.5	5.1	7	19	5	10	0	0	0	5	0
Aug	6	19	10	14	27	6	2	7	2	67.4	68.7	66.9	67.7	88.0	78.1	88.5	84.9	5.3	5.0	4.8	5.0	10	12	9	7	0	0	0	2	0
Sept	6	7	6	8	35	19	2	7	0	62.6	65.8	63.1	63.8	83.3	73.3	80.7	79.1	1.5	2.7	1.8	2.0	21	7	2	2	0	0	0	0	0
Oct	17	9	8	5	19	16	7	12	0	50.9	54.4	51.5	52.3	77.4	72.9	77.5	75.9	3.8	4.0	3.8	3.9	14	13	4	9	0	0	0	0	0
Nov	8	12	3	6	8	14	15	22	2	39.2	43.4	41.2	41.3	79.0	74.4	79.5	77.6	3.6	4.9	3.7	4.1	14	10	6	9	0	2	0	0	0
Dec	25	7	5	5	12	13	7	18	1	32.4	36.0	33.7	34.0	79.9	78.7	79.4	79.3	6.5	6.7	6.2	6.5	7	8	16	10	3	10	0	1	0
Sums	97	126	100	105	230	112	96	221	11	559.7	594.7	571.0	575.1	982.5	910.4	985.5	959.6	56.5	61.5	53.5	57.2	127	147	92	122	14	56	0	15	0
	Percentages.																					Percentages.								
Means	8.8	11.5	9.1	9.6	20.9	10.2	8.7	20.1	1.0	46.6	49.6	47.6	47.9	81.9	75.9	82.1	80.0	4.7	5.1	4.5	4.8	34.7	40.2	25.1	33.3	3.8	15.3	0	4.1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7.08 a. m., January 1, to 11.08 December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030: March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

REMARKS.—Last frost, March 16; first frost, October 10. Last snow, March 5; first snow, December 18.

W. EASBY SMITH,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CAPE MENDOCINO, CAL.

Location of office on December 31, 1884, on mountain east of light-house.

[Latitude, 40° 26′ N.; longitude, 124° 24′ W. Elevation of barometer above sea-level, 637 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain gauge, above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.384	29.391	29.363	29.379	29.783	11	28.583	26	1.150	45.9	50.1	48.3	48.1	61.5	31	36.5	29	25.0	58.0	43.5	1.27	.43	28	100	SE.	4, 5, 26	SE.	[1]13,160
Feb	29.278	29.308	29.273	29.286	29.748	22	28.584	16	1.164	42.5	48.2	46.4	45.7	68.5	25	28.5	12	40.0	51.6	40.3	1.95	.48	17	([2])	([2])	([2])	SE.	([2])
Mar	29.257	29.257	29.268	29.261	29.622	19	28.442	9	1.180	43.9	51.1	47.6	47.5	63.5	2	36.0	11	27.5	53.7	41.7	3.52	.60	22	92	SE.	9	NW.	[3]8,471
Apr	29.271	29.284	29.281	29.279	29.575	25	28.875	10	.700	46.0	52.3	48.8	49.0	63.1	8	38.3	27	24.8	54.2	43.8	3.36	.83	13, 14	80	SE.	11	SE.	15,133
May	29.300	29.316	29.311	29.312	29.497	3	29.124	18	.373	49.4	55.0	51.6	52.0	69.5	8	42.1	4	27.4	58.2	47.2	0.33	.10	20, 26	64	SE.	25	NW.	12,607
June	29.299	29.309	29.308	29.305	29.552	24	29.058	11	.494	51.6	57.6	54.6	54.6	64.9	15	46.6	6	18.3	60.4	49.5	0.92	.26	11, 12	61	SE.	23	NW.	12,665
July	29.344	29.358	29.343	29.348	29.488	19	29.163	12	.325	53.2	57.9	55.8	55.6	64.2	11	47.2	30	17.0	60.5	50.5	0.45	.10	13, 14, 30	45	N.	30	N.	16,385
Aug	29.305	29.312	29.302	29.306	29.474	5	29.149	11	.325	53.7	59.0	57.1	56.6	68.9	26	47.2	1	21.7	63.2	51.3	0.33	.07	11	52	SE.	2	N.	16,418
Sept	29.328	29.337	29.331	29.332	29.497	9	29.080	30	.417	52.9	58.6	55.5	55.7	68.0	16	45.0	30	23.0	61.7	50.8	1.18	.57	30	62	SE.	20	N.	13,419
Oct	29.346	29.354	29.348	29.349	29.543	31	28.927	12	.616	50.7	56.9	54.9	54.2	75.8	23	42.7	1	33.6	60.9	49.1	0.52	.16	5, 30	68	S.	12	N.	12,964
Nov	29.367	29.383	29.364	29.371	29.582	25	29.158	10	.429	50.5	55.9	54.1	53.5	67.8	5	43.0	28, 30	24.8	59.8	48.6	0.40	.12	6, 7	68	SE.	6	N.	12,942
Dec	29.204	29.235	29.200	29.213	29.599	5	28.546	25	1.053	46.7	50.2	49.8	48.7	64.6	18	34.0	29	30.6	54.0	44.5	2.58	.46	20	108	SE.	16	S.	[4]16,870
Sums	351.692	351.844	351.692	351.741	......	..	....	...	8.226	587.0	652.8	624.0	621.2	....	....	....	....	318.7	691.2	560.8	16.81	....	....	..	......	......	....	....
Means	29.308	29.320	29.308	29.312	29.748	[5]22	28.442	[6]9	.686	48.9	54.4	52.0	51.8	75.8	[7]23	28.5	[5]12	26.1	57.6	46.7	.....	...	....	...	......	......	N.	....

[1] For 23⅜ days. [2] Anemometer unserviceable. [3] For 19 days only. [4] For 29 1/12 days. [5] February. [6] March. [7] October.

CAPE MENDOCINO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	26	5	2	41	7	0	1	9	2	41.2	43.1	40.1	41.5	84.4	77.8	75.5	79.2	6.3	5.5	6.1	6.0	9	8	14	10	0	0	0	0	0
Feb	7	8	3	34	1	1	3	27	3	37.0	40.3	39.1	38.8	82.0	74.9	77.0	78.0	4.2	4.3	4.6	4.4	13	8	8	17	0	3	0	0	0
Mar	3	6	2	34	1	0	3	40	4	39.6	43.8	40.0	41.1	85.1	77.6	76.0	79.6	7.3	6.5	7.0	6.9	3	15	13	14	0	0	0	0	0
Apr	1	1	0	40	7	1	2	38	0	42.2	46.4	43.8	44.1	86.9	80.7	83.7	83.8	8.5	6.2	8.0	7.6	1	12	17	17	0	0	0	0	0
May	2	0	0	26	7	1	1	55	1	45.8	49.8	46.4	47.3	87.9	82.8	82.7	84.5	3.4	4.4	5.0	4.3	11	15	5	2	0	0	0	0	0
June	3	0	1	17	4	0	3	62	0	47.2	52.7	50.9	50.3	85.6	83.7	87.2	85.5	5.2	5.0	7.6	5.9	3	19	8	9	0	0	0	0	0
July	58	1	0	0	0	0	0	33	1	49.8	53.3	52.1	51.7	88.5	85.3	87.3	87.0	4.3	3.8	4.8	4.3	12	15	4	0	0	0	0	0	0
Aug	75	0	0	8	3	1	0	4	2	51.0	53.6	53.2	52.6	90.8	83.9	87.1	87.3	1.8	2.0	3.2	2.3	20	9	2	0	0	0	0	0	0
Sept	62	0	0	7	7	1	0	8	5	47.7	50.9	48.8	49.1	82.7	76.3	78.7	79.2	4.2	3.8	3.9	4.0	12	13	5	5	0	0	0	0	0
Oct	68	3	0	6	8	0	0	2	6	45.7	49.3	48.8	47.9	83.5	78.6	80.4	80.8	3.3	2.3	4.6	3.4	17	12	2	4	0	0	0	0	0
Nov	27	10	1	20	24	1	0	3	4	46.0	49.6	47.6	47.7	84.5	79.9	80.1	81.5	4.9	4.4	4.9	4.7	9	14	7	8	0	0	0	0	0
Dec	21	3	2	16	27	0	0	20	4	40.7	41.4	40.2	40.8	80.8	74.9	74.2	76.6	7.5	6.2	6.9	6.9	4	11	16	18	0	0	0	0	0
Sums ..	353	37	11	249	96	6	13	301	32	533.9	574.2	551.0	552.9	1,022.7	956.4	969.9	983.0	60.9	54.4	66.6	60.7	114	151	101	104	0	3	0	0	0
	Percentages.																					Percentages.								
Means .	32.1	3.4	1.0	22.7	8.7	0.5	1.2	27.4	2.9	44.5	47.8	45.9	46.1	85.2	79.7	80.8	81.9	5.1	4.5	5.6	5.1	31.1	41.3	27.6	28.4	0	0.8	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m, Washington time, correspond to 3.51 a. m., 11.51 a. m., and 7.51 p. m., local time.

Corrections for instrumental error of barometer used: From 3.51 a. m., January 1 to 7.51. p. m., September 30, inclusive, +.041 inch; from 3.51 a. m., October 1 to 7.51 p. m., December 31, inclusive, +.056 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.690; April, 0.690; May, 0.680; June, 0.680; July, 0.680; August, 0.680; September, 0.680; October, 0.690; November, 0.700; December, 0.700.

REMARKS.—Instrumental error of barometer No. 346 changed by authority L. R., dated O. C. S. O., September 26, 1884.

A. P. LEAVITT,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CEDAR KEYS, FLA.

Location of office on December 31, 1884, rooms Nos. 8 and 9, northwest corner of Second and C streets.

[Latitude, 29° 8′ N.; longitude, 83° 2′ W. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.241	30.181	30.234	30.219	30.561	21	29.763	8	.798	46.9	56.3	51.6	51.6	68.9	27	25.2	6	43.7	59.3	44.1	5.08	1.17	1	35	NW.	2	NW.	6,859
Feb	30.147	30.092	30.129	30.123	30.323	10	29.785	28	.538	59.4	68.3	62.5	63.4	77.4	12	37.2	29	40.2	69.8	57.2	1.56	.69	17, 18	40	SW.	20	S.	6,186
Mar	30.106	30.066	30.092	30.088	30.341	4	29.830	1	.511	62.3	71.3	66.6	66.7	78.9	22	42.2	1	36.7	73.1	60.8	2.21	.77	14	40	S.	19	S.	8,020
Apr	30.001	29.973	29.988	29.987	30.206	29	29.613	5	.593	65.0	73.5	68.4	69.0	84.8	18	50.7	10	34.1	75.0	62.7	3.58	2.35	5, 6	36	SW., E.	2, 12	W.	7,536
May	30.016	29.987	30.006	30.003	30.197	3	29.819	26	.378	74.5	81.5	75.0	77.0	90.0	21	60.5	31	29.5	82.7	70.5	1.96	.91	18	31	NE.	29	W.	7,006
June	30.000	29.965	29.989	29.985	30.143	27	29.742	22	.401	75.0	83.1	76.5	78.2	91.0	26	62.0	1	29.0	84.7	71.2	6.68	1.89	29	36	SE., S.	23	SW.	6,885
July	29.998	29.972	29.987	29.986	30.132	24	29.826	8	.306	80.8	85.9	80.7	82.5	91.0	8, 20	70.0	6	21.0	87.8	76.8	6.02	2.29	1, 2	25	NE.	21	W.	6,311
Aug	30.013	29.971	30.018	30.001	30.167	19	29.829	30	.338	78.2	86.3	79.0	81.2	92.5	3	69.9	5	22.6	88.1	74.4	8.11	2.00	5, 6	25	SW.	30	NE.	5,002
Sept	30.043	29.990	30.046	30.026	30.203	26	29.876	1	.327	76.4	86.0	78.6	80.3	90.0	1, 2, 7	66.9	16	23.1	86.9	73.6	3.63	1.29	1	32	NE.	5	NE.	6,281
Oct	30.075	30.015	30.073	30.054	30.297	24	29.853	9	.444	69.3	81.0	72.5	74.3	89.0	1, 8	52.7	24	36.3	82.1	67.2	.13	.10	21	26	NE.	15	NE.	7,285
Nov	30.087	30.030	30.086	30.068	30.225	11	29.707	28	.518	59.2	69.2	62.6	63.7	78.0	2	42.0	25	36.0	71.8	56.9	3.06	1.23	27	31	S.	28	NE., N.	6,002
Dec	30.134	30.080	30.120	30.111	30.316	19	29.782	6	.534	57.0	65.2	59.9	60.7	74.1	30	32.2	19	41.9	66.6	55.1	5.66	3.73	5	28	NW.	18	NE.	5,774
Sums	360.861	360.322	360.768	360.651	......	...	......	....	5.686	804.0	907.6	833.9	848.6	....	......	....	....	394.1	927.9	770.5	47.68	....	......	...	....	....	....	79,147
Means	30.072	30.027	30.064	30.054	30.561	*21	29.613	†5	.474	67.0	75.6	69.5	70.7	92.5	‡3	25.2	*6	32.8	77.3	64.2	.....	...	......	...	....	....	W.	.....

* January. † April. ‡ August.

CEDAR KEYS, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	18	9	2	14	4	14	22	1	42.9	49.7	46.8	46.5	86.6	79.3	83.9	83.3	4.4	4.2	2.1	3.6	15	11	5	9	0	5	0	1	0
Feb	5	11	10	5	17	13	14	12	0	54.7	57.0	57.3	56.3	86.0	69.0	84.1	79.7	2.7	2.9	1.9	2.5	19	5	5	11	0	0	0	3	0
Mar.	5	7	6	10	26	14	16	9	0	57.0	60.6	91.3	59.6	83.9	71.3	83.6	79.6	4.3	4.8	1.9	3.7	10	20	1	6	0	0	0	2	0
Apr.	6	2	6	2	19	16	26	13	0	57.0	59.1	60.0	58.7	77.0	62.5	75.5	71.7	3.9	3.6	2.9	3.5	16	9	5	7	0	0	0	5	0
May	9	7	5	6	5	17	39	5	0	67.5	66.9	66.8	67.1	79.0	62.0	75.6	72.2	3.8	3.8	2.0	3.0	20	8	3	5	0	0	0	0	0
June	4	14	16	4	16	20	9	3	4	69.1	69.0	69.5	69.2	82.5	63.9	79.6	75.3	5.9	5.6	3.8	5.1	3	22	5	10	0	0	1	1	0
July	4	11	1	2	3	30	37	4	1	74.0	73.3	73.4	73.6	80.6	67.8	79.4	75.9	4.1	4.9	3.1	4.0	11	18	2	16	0	0	4	9	0
Aug	7	28	11	5	4	13	18	5	2	73.1	72.7	72.8	72.9	85.0	65.0	82.0	77.3	3.6	5.1	4.8	4.5	11	17	8	17	0	0	8	9	0
Sept	11	32	14	6	3	7	13	4	0	71.0	71.5	70.9	71.1	83.9	62.4	77.9	74.7	1.8	4.4	1.7	2.6	19	11	0	5	0	0	0	4	0
Oct	21	32	19	0	2	2	9	7	1	63.9	65.6	64.9	64.8	83.7	59.7	77.8	73.7	0.5	3.0	0.7	1.4	24	7	0	2	0	0	0	0	0
Nov	23	23	12	4	4	4	10	7	3	52.8	56.7	54.6	54.7	80.9	67.0	76.5	74.8	3.2	4.0	3.3	3.5	13	12	5	8	0	0	0	0	0
Dec	15	21	15	6	18	2	8	7	1	53.5	57.4	55.3	55.4	88.4	77.1	85.1	83.5	4.0	3.5	4.1	3.9	16	8	7	5	0	0	0	0	0
Sums	119	206	124	52	131	142	213	98	13	736.5	759.5	753.6	749.9	997.5	807.0	961.0	921.7	41.7	49.8	32.3	41.3	177	148	41	101	0	5	18	34	0
	Percentages.																					Percentages.								
Means	10.8	18.8	11.3	4.7	11.9	12.9	19.4	8.9	1.2	61.4	63.3	62.8	62.5	83.1	67.2	80.1	76.8	3.5	4.2	2.7	3.5	48.4	40.4	11.2	27.0	0	1.4	3.6	9.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .002 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.
REMARKS.—January 6, 1884, was the coldest day (+ 25°.2) for many years. Orange trees were killed throughout a great portion of the state, causing immense losses.

A. J. MITCHELL,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHARLESTON, S. C.

Location of office on December 31, 1884, corner East Bay and Broad streets.

[Latitude, 32° 47′ N.; longitude, 79° 56′ W. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30. 150	30. 118	30. 158	30, 142	30. 596	27	29. 481	8	1. 115	42. 5	51. 7	45. 5	46. 6	70. 0	15	13. 0	6	57. 0	54. 9	38. 6	5. 89	3. 98	7, 8	32	SW.	8	SW.	6, 252
Feb	30. 058	30. 039	30. 070	30. 056	30. 414	10	29. 557	28	. 857	54. 5	64. 0	57. 6	58. 7	76. 0	8	27. 5	29	48. 5	67. 0	52. 0	4. 29	2. 79	16, 17	29	S.	19	SW.	5, 691
Mar*	30. 020	29. 991	30. 022	30. 011	30. 355	16	29. 595	1	. 760	55. 3	64. 9	59. 2	59. 8	81. 2	24	34. 0	1	47. 2	67. 7	53. 7	4. 39	1. 25	12, 13	28	NW.	8	SW.	6, 539
Apr	29. 897	29. 854	29. 883	29. 878	30. 120	11	29. 397	2	. 723	58. 6	69. 0	62. 2	63. 3	86. 4	29	43. 5	10	42. 9	70. 8	56. 2	8. 45	1. 36	21	36	W.	2	SW.	6, 076
May*	29. 951	29. 914	29. 945	29. 937	30. 181	22	29. 690	27	. 491	71. 6	80. 4	72. 5	74. 8	91. 3	20	60. 5	30	30. 8	82. 1	69. 0	2. 18	. 93	25, 26	27	E.	29	SW.	6, 068
June	29. 996	29. 971	29. 988	29. 985	30. 205	16	29. 693	11	. 512	73. 0	70. 7	74. 2	75. 6	89. 1	9	58. 2	2	30. 9	81. 6	69. 7	8. 25	1. 83	13, 14	23	NE., SW.	15 25	E.	6, 336
July	29. 914	29. 877	29. 908	29. 900	30. 095	23	29. 730	16	. 365	78. 9	87. 7	79. 9	82. 2	95. 0	14	69. 2	5	25. 8	88. 9	75. 9	9. 52	2. 30	12	22	W.	13	SW.	5, 466
Aug	29. 987	29. 959	29. 983	29. 976	30. 148	19	29. 754	31	. 394	75. 4	83. 6	77. 8	78. 9	90. 8	1	67. 6	13	23. 2	85. 8	72. 6	6. 12	2. 12	6	21	SW.	2	NE.	‖4, 505
Sept	30. 035	30. 005	30. 032	30. 024	30. 214	26	29. 734	12	. 480	73. 2	82. 0	76. 3	77. 2	89. 4	1	62. 0	15	27. 4	83. 1	71. 5	11. 03	5. 44	12	32	E. NE.,	10 13	E.	6, 003
Oct	30. 092	30. 051	30. 078	30. 074	30. 412	20	29. 847	30	. 565	67. 1	76. 7	69. 9	71. 2	91. 4	6	45. 2	24	46. 2	77. 9	65. 3	. 35	. 14	12	24	NE.	15	NE.	5, 401
Nov	30. 065	30. 020	30. 063	20. 046	30. 328	7	29. 538	28	. 790	53. 8	65. 2	58. 2	59. 1	73. 9	3	40. 5	7	33. 4	67. 2	51. 8	1. 49	53	19, 20	24	SW.	23, 28, 29	N.E., NW.	4, 568
Dec	30. 127	30. 075	30. 117	30. 106	30. 454	27	29. 704	6	. 750	49. 7	58. 3	53. 2	53. 7	70. 0	12	26. 0	20	44. 0	60. 3	46. 3	3. 26	1. 97	6	28	S.	6	NE.	5, 112
Sums	360. 292	359. 874	360. 237	360. 135	....	...	....	...	7. 802	753. 6	863. 2	786. 5	801. 1	....	...	....	..	457. 3	86. 8	722. 6	60. 22	....	......	..	....	...	......	¶68,017
Means	30. 024	29. 990	30. 020	30. 011	30. 596	†27	29. 397	‡2	. 650	62. 8	71. 9	65. 5	66. 7	95. 0	§14	13. 0	†6	38. 1	73. 9	60. 2	....	....	......	..	....	..	SW.	......

* One 7 a. m. observation missed.

† January.

‡ April.

§ July.

‖ 29½ days.

¶ 364½ days.

CHARLESTON, S. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum below 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	13	8	1	2	27	15	16	1	38.3	40.1	39.4	39.3	85.6	67.0	79.9	77.5	5.9	5.8	4.4	5.4	10	11	10	12	1	7	0	2	0
Feb	2	12	9	4	4	25	15	7	9	50.2	50.8	51.6	50.9	86.2	65.5	81.8	77.8	4.3	4.2	4.0	4.2	11	14	4	10	0	1	0	2	0
Mar	4	11	13	3	3	35	13	9	1	50.0	52.4	53.8	52.1	83.2	67.1	83.9	78.1	4.9	4.7	4.6	4.7	12	9	9	12	0	0	0	4	0
Apr	6	7	10	2	1	34	18	11	1	51.2	50.9	54.6	52.2	77.6	57.7	77.9	71.1	6.2	5.4	4.0	5.2	10	11	9	11	0	0	0	1	0
May	2	10	19	5	6	30	16	2	2	65.4	64.7	66.4	65.5	81.3	60.0	81.9	74.4	4.2	5.0	4.4	4.5	7	18	5	5	0	0	1	2	0
June	2	17	30	9	5	24	0	1	2	68.4	68.8	69.4	68.9	85.8	70.8	85.5	80.7	7.1	7.0	5.5	6.5	3	14	13	14	0	0	0	3	0
July	3	4	11	2	6	53	11	1	2	73.4	73.8	73.5	73.6	84.2	64.7	81.9	76.9	5.2	6.2	3.9	5.1	6	19	6	13	0	0	11	12	0
Aug	4	25	20	3	1	19	9	3	9	71.2	71.8	72.9	72.0	87.3	68.8	84.7	80.3	5.9	6.4	3.6	5.3	3	20	8	16	0	0	1	8	0
Sept	4	29	34	1	3	8	3	2	6	70.5	71.4	71.2	71.0	91.5	71.1	84.7	82.4	3.4	5.7	2.5	3.9	13	14	3	6	0	0	0	1	0
Oct	7	36	32	0	0	9	4	4	1	62.6	62.6	63.6	62.9	86.1	63.8	81.5	77.1	3.3	3.8	2.4	3.2	16	12	3	6	0	0	1	0	0
Nov	17	18	12	2	1	9	13	18	0	47.0	50.2	50.6	49.3	79.2	61.3	76.8	72.4	3.4	4.2	2.9	3.5	15	10	5	8	0	0	0	1	0
Dec	22	26	8	0	2	17	8	4	6	45.4	49.8	48.4	47.9	85.8	75.0	84.3	81.7	6.4	6.8	4.5	5.9	7	12	12	11	0	2	0	0	0
Sums	83	208	206	32	34	290	125	78	40	693.6	707.3	715.4	705.6	1013.8	792.8	984.8	930.4	60.2	65.2	46.7	57.4	113	164	87	124	1	10	14	36	0
	Percentages.																					Percentages.								
Means	7.6	19.0	18.8	2.9	3.1	26.5	11.4	7.1	3.6	57.8	58.9	59.6	58.8	84.5	66.1	82.1	77.6	5.0	5.4	3.9	4.8	31.0	45.0	24.0	33.9	.3	2.7	3.8	9.8	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time.
Correction for instrumental error of barometer used: From 6.48 a. m., January 1, to 10.48 p. m., December 31, 1884, inclusive, —.028.
The barometric obstructions may be reduced to sea-level by adding the following constants for the various months: January, .060; February, .060; March, .060; April, .060; May, .050; June, .050; July, .050; August, .050; September, .050; October, .060; November, .060; December, .060.

J. H. SMITH,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHATTANOOGA, TENN.

Location of office on December 31, 1884, northeast corner third floor Hamilton County court-house.

[Latitude, 35° 4′ N.; longitude, 85° 15′ W. Elevation of barometer above sea-level, 783 feet. Elevation of exposed thermometer above ground, 48 feet. Elevation of rain-gauge above ground, 59 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.418	29.375	29.410	29.401	29.819	26	28.982	14	.837	30.3	38.2	34.1	34.2	62.0	31	— 1.0	6	63.0	43.5	26.0	5.88	1.34	23, 24	28	NW.	31	NW.	5,066
Feb	29.303	29.247	29.276	29.275	29.615	15	28.746	27	.869	43.5	54.1	48.3	48.6	70.0	11	11.0	29	59.0	57.1	41.4	8.81	3.19	7	29	SW.	19	NE., NW.	4,570
Mar	29.236	29.203	29.226	29.222	29.591	9 16	28.791	1	.800	46.9	58.2	52.9	52.7	78.0	25	22.8	1	55.2	62.0	44.9	10.19	2.65	5, 6	31	SW.	5	SW.	5,766
Apr	29.160	29.118	29.148	29.142	29.396	29	28.810	2	.586	51.6	63.8	56.0	57.1	84.5	30	34.5	9	50.0	66.6	49.0	5.95	2.62	14, 15	40	NW.	2	SW., W	4,768
May	29.205	29.150	29.184	29.180	29.409	31	28.969	6	.440	62.0	77.8	66.5	68.8	89.0	22	51.6	15	37.4	79.5	60.0	2.22	.55	1	20	SW.	1 4, 6	SW.	4,250
June	29.228	29.180	29.201	29.203	29.499	16	28.909	10	.590	67.0	78.3	69.3	71.5	91.5	21	55.4	1	36.1	80.9	64.9	9.20	3.45	6, 7	20	SW., E., NW.	9 22 25	NE.	3,034
July	29.176	29.129	29.154	29.153	29.314	22	28.980	9	.334	71.4	84.1	74.3	76.6	91.6	5	61.0	7	30.6	86.5	69.5	4.79	.86	10	25	NW.	31	SW.	3,434
Aug	29.276	29.219	29.255	29.250	29.402	19	29.026	29	.376	68.1	83.3	71.9	74.4	91.8	27	60.8	6	31.0	84.9	67.0	2.54	1.66	28, 29	24	NW.	3	NW.	2,798
Sept	29.317	29.251	29.294	29.287	29.512	14	29.126	23	.386	65.5	83.0	71.3	73.3	89.8	7	52.4	19	37.4	83.9	65.0	2.00	1.18	8, 9	20	SW.	22	S.	2,675
Oct	29.370	29.302	29.346	29.339	29.629	20	29.095	8	.534	58.9	75.8	63.9	66.2	90.8	5	34.0	24	56.8	76.8	57.5	1.83	.95	27, 28	24	S.	26	NW.	3,427
Nov	29.342	29.281	29.328	29.317	29.639	6	28.725	28	.914	40.9	57.9	47.2	48.7	68.9	2	27.1	15	41.8	59.5	38.5	1.75	.54	28	24	SW.	23	NW.	2,927
Dec	29.338	29.295	29.338	29.324	29.644	10	28.803	6	.841	38.9	48.5	42.0	43.1	64.8	11	8.3	19	56.5	52.2	34.9	6.80	2.42	20, 21	28	SW.	6	S.	4,664
Sums	351.369	350.750	351.160	351.093	......	...	....	...	7.507	645.0	803.0	697.7	715.2	....	....	....	...	554.8	833.4	618.6	61.96	...	......	...	....	....	....	47,879
Means	29.281	29.229	29.263	29.258	29.819	*26	28.725	†28	.626	53.8	66.9	58.1	59.6	91.8	‡27	— 1.0	*6	46.2	69.4	51.6	.....	...	......	...	....	....	NW.	......

* January. † November. ‡ August.

CHATTANOOGA, TENN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).			
										Washington time.											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7. a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.
1884.										°	°	°	°								
Jan	9	17	7	3	9	17	9	21	1	23.9	27.1	24.8	25.3	76.7	65.0	69.1	70.3	6.7	7.5	6.0	6.7
Feb ...	8	16	7	9	15	12	3	16	1	37.2	39.7	40.6	39.2	78.6	61.7	75.6	72.0	6.3	7.2	6.0	6.5
Mar ...	9	16	8	7	14	19	4	16	0	39.5	41.0	42.0	40.8	76.1	56.4	69.4	67.3	6.9	7.2	5.6	6.6
Apr ...	11	9	8	9	8	15	15	14	1	44.2	43.7	45.8	44.6	77.6	51.8	70.5	66.6	6.1	7.2	5.3	6.2
May ...	13	12	3	7	7	23	11	15	2	56.3	54.8	56.4	55.8	82.1	47.2	71.4	66.9	5.1	6.7	3.2	5.0
June ..	4	24	10	10	15	7	10	9	1	64.3	63.8	64.9	64.3	91.5	63.9	86.8	80.7	6.0	7.5	6.4	6.0
July ...	15	7	2	4	5	35	16	6	3	68.4	68.4	69.3	68.7	90.5	60.6	84.8	78.6	6.0	5.7	3.0	4.9
Aug ...	15	17	6	9	9	9	2	20	6	65.7	67.2	67.7	66.9	92.2	58.9	86.8	79.3	4.3	6.8	3.4	4.8
Sept ...	14	14	7	9	18	3	4	8	11	63.5	68.6	67.0	66.4	93.4	62.2	86.5	80.7	4.0	5.6	3.3	4.3
Oct	9	17	9	12	6	9	4	20	7	54.2	53.2	55.5	54.3	84.9	48.5	75.4	69.6	3.0	4.2	2.9	3.4
Nov ...	10	5	8	8	10	12	12	16	9	36.8	39.4	39.4	38.5	85.8	52.0	74.7	70.7	3.3	3.3	2.9	3.2
Dec ..	5	15	4	14	20	7	8	19	1	33.5	35.7	34.8	34.7	80.9	63.4	75.9	73.4	7.2	6.9	6.1	6.7
Sums .	122	169	79	101	136	170	98	180	43	587.5	602.6	608.2	599.5	1009.8	691.6	926.9	876.1	64.9	75.8	54.1	64.9
	Percentages.																				
Means.	11.1	15.4	7.2	9.2	12.4	15.5	8.9	16.4	3.9	49.0	50.2	50.7	50.0	84.2	57.6	77.2	73.0	5.4	6.3	4.5	5.4

Month.	Number of days—								River.									
	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.									Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan	5	11	15	13	2	19	0	1	14	10	21	3	5	10	11	5	8	6.7
Feb ...	5	9	15	16	1	8	0	2	36	10	11	9	7	29	27	3	22	7.3
Mar ...	6	10	15	10	0	6	0	3	43	0	11	7	11	5	35	1	24	0.6
Apr ...	6	10	14	15	0	0	0	6	16	11	17	6	6	13	10	5	10	11.4
May ...	4	20	7	9	0	0	0	9	11	5	7	4	4	31	7	1	6	9.9
June ..	5	12	13	19	0	0	3	8	11	5	29	3	5	6	8	0	5	11.4
July ...	7	17	7	16	0	0	5	9	8	4	1	2	7	25	5	9	4	10.4
Aug ...	7	19	5	6	0	0	1	6	9	10	2	1	10	28, 29	8	0	3	4.5
Sept ...	9	18	3	5	0	0	0	2	3	2	1	0	7	28–30	2	7	1	3.1
Oct	20	5	6	5	0	0	4	0	1	1	31	0	2	19–21	0	11	0	5.6
Nov ...	15	10	5	4	0	4	0	0	1	10	27, 29	0	7	17	1	3	1	0.0
Dec ..	6	9	16	14	1	11	0	1	12	7	23	1	1	5, 6, 7	11	6	4	2.4
Sums .	95	150	121	141	4	48	13	47	......		......	......		......	129	3	94	1.3
	Percentages.																	
Means.	26.0	41.0	33.1	38.5	1.1	13.1	3.6	12.8	43	0	*11	0	2	†19-21	10	9.2	7	10.1

* March. † October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.27 a. m., 2.27 p. m., and 10.27 p. m., local time.

Corrections for instrumental error of barometer used: From 6.27 a. m., January 1, to 2.27 p. m., March 29, inclusive, +.003 inch; from 6.27 p. m., March 29, to 10.27 p. m., December 31, 1884, inclusive, −.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.860; February, 0.860; March, 0.850; April, 0.830; May, 0.810; June, 0.810; July, 0.800; August, 0.800; September, 0.810; October, 0.830; November, 0.850; December, 0.860.

REMARKS.—Flood in Tennessee River passed danger line (33 feet) March 8; reached highest point since 1875 (43 feet) on March 11, and subsided below danger line March 15. Heated term in October of unusual intensity; maximum temperature over 90° on 3d, 4th, 5th, and 6th. A remarkably heavy sleet storm December 21, coating exposed objects with ice one-half inch thick.

B. L. GOULDING,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHEYENNE, WYO.

Location of office on December 31, 1884, Commercial Building.

[Latitude, 41° 8′ N.; longitude, 104° 48′ W. Elevation of barometer above sea-level, 6,105 feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	23.963	23.950	23.977	23.963	24.297	20	23.602	6	.695	20.4	29.6	20.9	23.6	50.2	12	—11.0	15	61.2	33.8	12.8	.76	.48	14	48	NW.	31	NW.	10,751
Feb	23.840	23.825	23.852	23.839	24.161	26	23.287	18	.874	19.4	29.6	22.0	23.7	50.1	24	—28.2	12	78.3	33.6	13.6	.26	.15	3, 4	50	NW.	20	NW.	10,247
Mar	23.819	23.812	23.840	23.824	24.160	13	23.241	10	.919	25.3	38.7	28.4	30.8	58.9	15	1.5	6	57.4	41.8	21.2	1.59	.93	20, 21	56	NW.	27	NW.	9,974
Apr	23.909	23.912	23.934	23.918	24.242	19	23.558	13	.684	29.2	45.0	34,5	36.2	69.9	24	18.3	2	51.6	49.4	26.9	1.33	.92	25, 26	34	NW.	7	NW.	8,060
May	24.027	24.016	24.044	24.029	24.300	8	23.703	4	.597	41.7	58.8	48.3	49.6	79.8	8	22.0	1	57.8	64.7	38.6	4.83	.94	28, 29	34	{NW., SE.}	{10 20}	NW.	7,749
June	24.083	24.081	24.089	24.084	24.272	18	23.829	11	.443	50.9	73.7	58.8	61.1	93.4	27	43.2	16	50.2	78.2	49.1	1.50	.88	7	43	SW.	26	S.	6,673
July	24.101	24.081	24.092	24.091	24.288	8	23.966	21	.322	54.9	78.4	63.6	65.6	90.0	6	44.0	29	46.0	81.8	52.3	.60	.46	29	34	NW.	29	NW.	8,138
Aug	24.142	24.131	24.145	24.139	24.330	3	23.860	19	.470	51.5	72.4	59.5	61.1	86.5	31	39.7	3	46.8	75.3	49.3	2.07	.86	18, 19	36	NW.	1	NW.	6,741
Sept	24.020	23.994	24.006	24.007	24.330	19	23.662	7	.668	46.0	69.0	54.6	56.5	82.5	1	28.5	30	54.0	72.8	42.8	1.25	1.01	14, 15	45	NW.	10	NW.	8,596
Oct	24.078	24.046	24.087	24.070	24.440	16	23.653	1	.787	38.4	60.7	43.6	47.6	76.8	2	9.4	27	67.4	63.2	33.8	.50	.26	26	42	W.	5	NW.	7,473
Nov	24.064	24.052	24.084	24.067	24.300	7	23.708	21	.592	29.5	47.2	32.0	36.2	65.7	6	1.6	23	64.1	49.2	28.8	.18	.09	17	56	NW.	26	NW.	8,476
Dec	23.813	23.802	23.834	23.816	24.201	8	23.302	21	.899	16.2	25.5	14.7	18.8	61.2	1	—13.4	16	74.6	31.1	6.5	.67	.21	11	44	W.	19	W.	7,533
Sums	287.859	287.702	287.984	287.847	......	..	......	...	7.950	428.4	628.6	480.9	510.8	....	....	......	...	709.4	674.9	370.7	15.54	....	......	..	....	....	......	100,411
Means	23.988	23.975	23.998	23.987	24.440	*16	23.241	†10	.662	35.8	52.4	40.1	42.6	93.4	‡27	—28.2	§12	59.1	56.2	30.9	.....	....	......	...	....	....	NW.	......

* October. † March. ‡ June. § February.

CHEYENNE, WYO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	6	3	0	2	7	17	48	0	9.4	13.9	9.7	11.0	63.2	53.5	64.5	60.4	1.7	3.6	3.1	2.8	18	9	4	7	13	31	0	0	0
Feb	9	5	1	9	7	6	15	34	1	8.8	12.2	10.4	10.5	65.4	50.9	62.3	59.5	2.9	4.8	3.4	3.7	15	9	5	7	9	27	0	0	0
Mar	13	7	3	6	12	6	14	32	0	16.1	15.1	16.8	16.0	68.3	42.5	62.0	57.6	2.4	4.1	3.5	3.3	16	10	5	8	4	31	0	0	0
Apr	19	9	2	6	12	3	10	27	2	21.2	22.2	25.0	22.8	71.9	42.8	69.3	61.3	4.1	6.0	3.6	4.6	9	16	5	9	0	26	0	0	0
May	16	10	7	7	6	7	14	24	2	32.8	31.5	34.3	32.9	72.0	38.8	60.9	57.2	4.8	6.4	5.6	5.6	6	15	10	17	0	7	0	10	0
June......	5	2	4	11	22	12	11	19	4	43.1	41.0	44.7	42.9	76.1	33.9	61.2	57.1	3.3	4.4	2.3	3.3	15	13	2	9	0	0	1	8	0
July	3	5	3	7	13	12	11	37	2	39.2	26.8	41.4	35.8	59.6	20.0	49.5	43.0	2.0	3.7	2.6	2.8	20	9	2	5	0	0	0	3	0
Aug	6	7	3	14	15	9	8	29	2	41.6	36.9	43.0	40.5	71.3	33.2	57.7	54.0	3.1	3.5	3.5	3.4	15	12	4	12	0	0	0	5	0
Sept	5	3	0	6	18	12	11	34	1	30.7	26.1	32.2	29.7	57.8	23.7	46.4	42.6	3.1	2.5	2.9	2.8	16	11	3	6	0	1	0	2	0
Oct	10	3	2	3	20	8	14	32	1	25.9	27.0	28.9	27.3	63.4	31.1	58.2	50.9	3.0	3.6	3.3	3.3	15	11	5	4	0	12	0	1	0
Nov......	12	7	1	2	6	1	13	48	0	19.5	13.9	19.7	17.7	66.9	33.2	61.8	54.0	1.4	3.9	2.8	2.7	20	5	5	3	2	28	0	0	0
Dec	15	12	3	3	15	9	20	16	0	9.3	12.0	8.4	9.9	77.8	66.1	78.5	74.1	5.1	5.8	4.9	5.3	10	9	12	14	14	28	0	0	0
Sums ..	123	76	32	74	148	92	158	380	15	297.6	278.6	314.5	297.0	813.7	469.7	732.3	671.7	36.9	52.8	41.5	43.6	175	129	62	101	42	191	1	29	0
	Percentages.																					Percentages.								
Means .	11.2	6.9	2.9	6.7	13.5	8.4	14.4	34.6	1.4	24.8	23.2	26.2	24.7	67.8	39.1	61.0	56.0	3.1	4.4	3.5	3.7	47.8	35.3	16.9	27.6	11.5	52.2	0.3	7.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.09 a. m., 1.09 p. m., and 9.09 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11.03 p. m., December 31, 1884, inclusive, .000 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.270; February, 6.270; March, 6.200; April, 6.020; May, 5.890; June, 5.760; July, 5.710; August, 5.720; September, 5.880; October, 6.040; November, 6.230; December, 6.300.

EDGAR McGOVERN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHICAGO, ILL.

Location of office on December 31, 1884, Major Block, corner of Madison and La Salle streets.

[Latitude, 41° 52′ N.; longitude, 87° 38′ W. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 93 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.407	29.401	29.423	29.410	29.926	26	28.759	13	1.167	16.6	23.0	17.9	19.2	49.3	30	—18.5	5	67.8	26.5	11.1	1.39	.39	1, 2	26	W.	30	W.	6,713
Feb	29.304	29.280	29.298	29.294	29.758	15	28.702	19	1.056	24.8	30.5	27.7	27.7	53.0	19	— 2.8	29	55.8	35.4	20.3	3.27	1.13	12	26	W.	19	NW.	5,412
Mar	29.307	29.280	29.294	29.294	29.739	30	28.642	25	1.097	30.5	38.0	34.1	34.2	59.2	27	— .9	4	60.1	41.1	27.3	5.16	3.20	25	28	SW.	11	N.	6,168
Apr	29.236	29.220	29.231	29.229	29.653	21	28.559	15	1.094	41.1	47.4	44.4	44.3	77.2	30	31.0	2	46.3	50.7	37.9	3.05	1.74	15	36	W.	27	E.	6,364
May	29.237	29.225	29.227	29.230	29.665	29	28.784	1	.881	53.4	61.0	55.7	56.7	78.0	22	40.0	2, 7	38.0	68.9	48.3	1.53	.08	1	25	NW.	27	N.	6,016
June*	29.351	29.320	29.324	29.332	29.570	14	28.984	9	.586	62.6	68.6	68.8	65.0	86.4	23	47.0	11	39.4	71.1	57.3	2.11	.62	1, 2	23	NW.	9	N.	4,496
July	29.227	29.211	29.207	29.215	29.488	20	28.936	5	.552	66.1	73.1	68.4	69.2	89.2	22	53.8	6	35.3	75.2	62.0	3.71	1.46	23, 24	28	NE.	23	E.	4,296
Aug	29.340	29.318	29.318	29.325	29.658	9	28.973	29	.680	65.5	73.3	68.5	68.8	91.2	19	51.1	10	40.1	74.9	61.7	2.50	1.27	28	20	SW.	25	S.	4,996
Sept	29.327	29.293	29.302	29.307	29.712	13	28.810	24	.902	64.2	73.7	68.8	68.9	88.7	9	50.6	21	38.1	75.5	62.0	2.29	1.09	27	24	W.	17	S.	5,800
Oct	29.416	29.380	29.392	29.396	29.816	14	29.084	5	.732	51.6	61.5	56.1	56.4	83.4	2, 5	27.7	23	55.7	64.2	48.6	3.59	1.39	7, 8	35	N.	8	SW.	5,745
Nov	29.355	29.345	29.359	29.353	29.741	6	†28.677	23	†1.064	35.5	44.0	39.3	39.6	64.4	9	5.4	24	59.0	48.8	33.1	1.80	.82	3, 4	22	NW.	23	SW.	5,441
Dec	29.370	29.353	29.356	29.360	29.898	25	28.576	6	1.317	25.4	31.0	28.8	28.4	61.2	30	−11.2	19	72.4	37.8	22.2	4.21	.93	28, 29	29	SW.	31	S.	6,574
Sums ..	351.877	351.626	351.731	351.745	......	...	....	...	†11.128	536.3	625.1	573.5	578.4	....	....	......	...	608.0	665.1	491.8	34.61	....	......	...	....	....	....	68,018
Means	29.323	29.302	29.311	29.312	29.926	‡26	28.559	§15	†.927	44.7	52.1	47.8	48.2	91.2	‖19	−18.5	‡5	50.7	55.4	41.0	.....	....	......	...	....	....	SW.	......

*One 7 a. m. observation missed. †See letter received, 485, observation, 1885. ‡January. §April. ‖August.

CHICAGO, ILL.—Continued.

Months	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan......	6	4	2	3	9	28	31	10	0	9.0	13.9	8.6	10.5	71.5	67.3	66.9	68.6	6.2	6.1	3.9	5.4	9	18	9	18	18	29	0	0	0
Feb......	4	16	5	5	16	7	16	17	1	16.9	21.3	18.5	18.9	71.7	68.8	67.9	69.5	6.6	8.1	6.5	7.1	4	11	14	16	8	25	0	0	0
Mar	19	12	10	5	13	7	12	18	2	22.7	26.0	24.5	24.4	72.5	62.7	67.9	67.7	6.6	6.9	6.1	6.5	4	11	16	15	9	15	0	0	0
Apr	21	11	24	4	4	5	10	11	0	33.4	32.6	33.8	33.3	74.0	58.9	69.2	67.6	5.9	6.9	4.8	5.9	9	9	12	9	0	1	0	2	0
May	24	7	10	9	16	17	6	4	0	43.9	44.8	44.5	44.4	71.9	57.1	67.6	65.5	4.8	5.6	3.3	4.6	9	17	5	10	0	0	0	2	0
June.....	24	11	17	6	5	6	5	9	7	55.0	56.0	56.5	55.8	75.9	65.5	77.7	73.0	6.1	5.5	3.3	5.0	9	12	8	6	0	0	0	4	0
July.....	13	13	15	4	11	10	13	13	1	58.2	58.1	59.0	58.4	76.2	61.0	72.6	69.9	5.3	6.2	2.5	4.7	5	25	1	12	0	0	0	6	0
Aug	7	14	18	5	19	8	10	8	4	57.5	56.5	58.1	57.4	78.2	56.6	70.0	68.3	4.2	4.3	2.1	3.5	15	12	4	9	0	0	1	2	0
Sept.....	7	8	14	4	22	21	12	2	0	56.7	56.6	58.8	57.4	77.4	57.4	71.1	68.6	3.9	3.6	3.6	3.7	15	9	6	8	0	0	0	1	0
Oct	8	3	7	7	15	27	20	6	0	44.6	46.7	46.5	45.9	77.1	60.0	70.9	69.3	4.4	5.1	3.1	4.2	14	11	6	10	0	1	0	2	0
Nov	9	3	5	5	10	23	17	17	1	30.4	33.7	32.2	32.1	81.6	68.1	76.3	75.3	5.7	4.9	3.9	4.8	9	14	7	9	2	9	0	1	0
Dec......	0	4	2	9	21	19	19	19	0	21.0	24.1	23.2	22.8	82.8	75.6	80.4	79.6	8.1	7.2	6.9	7.4	4	9	18	18	10	20	0	0	0
Sums ..	142	106	129	66	161	178	171	129	16	449.3	470.3	464.2	461.3	911.4	759.0	858.5	842.9	67.8	70.4	50.0	62.8	106	153	106	135	47	100	1	20	0
	Percentages.																					Percentages.								
Means .	12.9	9.7	11.7	6.0	14.7	16.2	15.6	11.7	1.5	37.4	39.2	38.7	38.4	76.0	63.2	71.5	70.2	5.6	5.9	4.2	5.2	29.0	41.9	29.0	36.9	12.8	27.3	.3	5.5	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.18 a. m., 2.18 p. m., and 10.18 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.750; February, 0.750; March, 0.740; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.740; December. 0.760.

REMARKS.—Frequent halos during first ten days of January; heavy rain February 12; heavy rain March 25; heavy snow April 20, severe gale 27; severe frost May 20; heavy frost October 23 (first frost for season); thunder-storm November 16; cold spell December 16 to 27.

T. B. JENNINGS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHIMO, FORT, UNGAVA BAY, LABRADOR.

[Latitude, 59° N.; longitude, 68° W. Elevation of barometer above sea-level, 126 feet. Elevation of exposed thermometer above ground, — feet. Elevation of rain-gauge above ground, — feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	29. 778	29. 761	29. 785	29. 775	30. 503	27	28. 440	4	2. 153	−23. 5	−19. 6	−23. 8	−22 3	17. 0	10	−50. 0	22	67. 0	−15. 5	−31. 9	. 78	. 64	10	58	N.	3	S.	7, 017
Feb	29. 861	29. 843	29. 878	29. 861	30. 553	8	28. 881	20	1. 672	−19. 3	−13. 1	−18. 5	−17. 0	30. 0	20	−35. 0	(‡)	65. 0	− 8. 7	−25. 7	. 70	. 17	20	58	SW.	11	SW.	10, 241
Mar	29. 914	29. 920	29. 935	29. 923	30. 569	27	29. 087	21	1. 482	−12. 7	− 2. 5	−11. 1	− 8. 8	28. 0	29	−41. 0	3	69. 0	1. 0	−21. 4	1. 17	. 51	13	61	NW.	22	S.	8, 802
Apr	30. 055	30. 067	30. 093	30. 072	30. 567	29	29. 650	27	917	17. 9	23. 5	15. 7	19. 0	52. 0	20	−13. 0	12	65. 0	26. 7	7. 2	. 84	. 39	17, 18	36	SW.	20	NE.	*4, 715
May	29. 863	29. 861	29. 867	29. 864	30. 429	7	29. 240	3	1. 189	34. 7	43. 4	32. 7	36. 0	72. 0	20	10. 0	1	62. 0	45. 6	25. 5	2. 02	. 54	4	Gale.	SW.	27	N.	......
June	29. 713	29. 701	29. 704	29. 706	30. 216	1, 13	29. 212	24	1. 040	40. 7	46. 6	38. 7	42. 0	74. 0	17	25. 0	4, 5	49. 0	50. 2	31. 3	5. 46	. 91	11, 12	Gale.	NW. SW. W.	3, 12, 25, 26, 29 4, 14, 23 5, 17, 24	W.	......
July	29. 835	29. 820	29. 838	29. 831	30. 425	8	29. 483	1	. 942	53. 4	62. 1	47. 0	54. 2	86. 0	14 15	27. 0	8	59. 0	68. 8	39. 2	1. 40	. 57	28, 29	Gale.	SW.	28	N.	......
Aug†	29. 739	29. 723	29. 731	29. 731	30. 108	22	29. 132	10	. 876	48. 6	57. 5	43. 2	49. 8	80. 0	6	23. 0	23	57. 0	61. 8	37. 2	3. 28	. 93	1	Storm.	SW.	10	NW.	......
Sept	......	......	......	......	......	......	......	...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Oct	......	......	......	......	......	......	......	...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Nov	......	......	......	......	......	......	......	...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Dec	......	......	......	......	......	......	......	...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Sums	......	......	......	......	......	......	......	...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Means	......	......	......	......	......	......	......	...	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

* For 25 days. † For 24½ days. ‡ 3, 8, 10, 11, 18.

CHIMO, FORT, UNGAVA, LABRADOR—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	4	5	3	0	33	23	2	1	22	−23.5	−19.6	−23.8	−22.3	100.0	100.0	100.0	100.0	3.3	4.4	3.6	3.8	14	10	7	8	31	31	0	...	34
Feb	4	6	0	4	12	43	3	3	12	−19.3	−13.1	−18.5	−17.0	100.0	100.0	100.0	100.0	5.3	6.2	3.9	5.1	8	12	9	10	29	29	0	...	21
Mar	4	8	0	3	27	19	7	7	18	−12.7	− 2.5	−11.1	− 8.8	100.0	100.0	100.0	100.0	5.4	5.3	5.0	5.2	8	14	9	12	31	31	0	...	36
Apr	14	19	0	3	10	13	3	15	13	17.0	21.5	15.2	17.9	96.3	92.6	97.9	95.6	8.2	6.9	7.3	7.5	3	8	19	10	20	29	0	...	8
May	31	16	6	1	8	9	8	12	2	27.8	34.5	26.9	29.7	76.8	71.9	79.5	76.1	7.1	7.4	6.7	7.1	7	4	20	10	1	27	0	...	1
June	9	3	4	4	5	22	23	20	0	32.2	35.5	32.4	33.4	74.0	66.9	.9.5	73.5	8.0	8.9	9.0	8.6	1	5	24	21	0	16	0	...	1
July	30	13	5	11	18	10	2	7	2	42.9	48.2	37.9	43.0	69.0	60.8	73.1	67.6	6.3	6.6	6.1	6.3	8	6	17	8	0	3	0	...	13
Aug	7	5	8	3	7	15	14	17	0	38.6	41.6	36.1	38.8	69.7	57.3	76.8	67.9	8.4	7.6	8.2	8.1	0	9	15	10	0	3	0	..	4
Sept																														
Oct																														
Nov																														
Dec																														
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.35 a. m., 3.35 p. m., and 11.35 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., August 25, 1884, inclusive, —.002 inch.
Station closed August 25.

LUCIEN M. TURNER,
Observer, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHATTANOOGA, TENN.

Location of office on December 31, 1884, northeast corner third floor Hamilton County court-house.

[Latitude, 35° 4′ N.; longitude, 85° 15′ W. Elevation of barometer above sea-level, 783 feet. Elevation of exposed thermometer above ground, 43 feet. Elevation of rain-gauge above ground, 59 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.418	29.375	29.410	29.401	29.819	26	28.982	14	.837	30.3	38.2	34.1	34.2	62.0	31	— 1.0	6	63.0	43.5	26.0	5.88	1.34	23, 24	28	NW.	31	NW.	5,066
Feb	29.303	29.247	29.276	29.275	29.615	15	28.746	27	.869	43.5	54.1	48.3	48.6	70.0	11	11.0	29	59.0	57.1	41.4	8.81	3.19	7	29	SW.	19	NE., NW.	4,570
Mar	29.236	29.203	29.226	29.222	29.591	9 16	28.791	1	.800	46.9	58.2	52.9	52.7	78.0	25	22.8	1	55.2	62.0	44.9	10.19	2.65	5, 6	31	SW.	5	SW.	5,766
Apr	20.160	29.118	29.148	29.142	29.396	29	28.810	2	.586	51.6	63.8	56.0	57.1	84.5	30	34.5	9	50.0	66.6	49.0	5.95	2.62	14, 15	40	NW.	2	SW., W	4,768
May	29.205	29.150	29.184	29.180	29.409	31	28.969	6	.440	62.0	77.8	66.5	68.8	89.0	22	51.6	15	37.4	79.5	60.0	2.22	.55	[illegible]	20	SW.	1 4, 6	SW.	4,250
June	29.228	29.180	29.201	29.203	29.499	16	28.909	10	.590	67.0	78.3	69.3	71.5	91.5	21	55.4	1	36.1	80.9	64.9	9.20	3.45	6, 7	20	SW., E., NW.	9 22 25	NE.	3,034
July	29.176	29.120	29.154	29.153	29.314	22	28.980	9	.834	71.4	84.1	74.3	76.6	91.6	5	61.0	7	30.6	86.5	69.5	4.79	.86	10	25	NW.	31	SW.	3,434
Aug	29.276	29.219	29.255	29.250	29.402	19	29.026	29	.376	68.1	83.8	71.9	74.4	91.8	27	60.8	6	31.0	84.9	67.0	2.54	1.66	28, 29	24	NW.	3	NW.	2,798
Sept	29.317	29.251	29.294	29.287	29.512	14	29.126	23	.386	65.5	83.0	71.3	73.3	89.8	7	52.4	19	37.4	83.9	65.0	2.00	1.18	8, 9	20	SW.	22	S.	2,675
Oct	29.370	29.302	29.346	29.339	29.629	20	20.095	8	.584	58.9	75.8	63.9	66.2	90.8	5	34.0	24	56.8	76.8	57.5	1.83	.95	27, 28	24	S.	26	NW.	3,427
Nov	29.342	29.281	29.328	29.317	29.639	6	29.725	28	.914	40.9	57.9	47.2	48.7	68.0	2	27.1	45	41.8	59.5	38.5	1.75	.54	28	24	SW.	23	NW.	2,927
Dec	29.338	29.295	29.338	29.324	29.644	19	28.803	6	.841	38.9	48.5	42.0	43.1	64.8	11	8.3	19	56.5	52.2	34.9	6.80	2.42	20, 21	28	SW.	6	S.	4,664
Sums	351.860	350.750	351.160	351.093	.....	...	....	...	7.507	645.0	803.0	697.7	715.2	....	....	......	...	554.8	833.4	618.6	61.90	...	......	...	....	....	....	47,879
Means	29.281	29.229	29.263	29.258	29.819	*26	28.725	†28	.626	53.8	66.9	58.1	59.6	91.8	‡27	— 1.0	*6	46.2	69.4	51.6	.....	...	......	...	....	....	NW.	......

* January.

† November.

‡ August.

CHATTANOOGA, TENN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—							River.									
										Washington time.																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	*Ft.*	*In.*		*Ft.*	*In.*		*Ft.*	*In.*	*Ft.*	*In.*
Jan	9	17	7	3	9	17	9	21	1	23.9	27.1	24.8	25.3	76.7	65.0	69.1	70.3	6.7	7.5	6.0	6.7	5	11	15	13	2	19	0	1	14	10	21	3	5	10	11	5	8	6.7
Feb ...	8	16	7	9	15	12	3	16	1	37.2	39.7	40.6	39.2	78.6	61.7	75.6	72.0	6.3	7.2	6.0	6.5	5	9	15	16	1	8	0	2	36	10	11	9	7	29	27	3	22	7.3
Mar ...	9	16	8	7	14	19	4	16	0	39.5	41.0	42.0	40.8	76.1	56.4	69.4	67.3	6.9	7.2	5.6	6.6	6	10	15	19	0	6	0	3	43	0	11	7	11	5	35	1	24	0.6
Apr ...	11	9	8	9	8	15	15	14	1	44.2	43.7	45.8	44.6	77.6	51.8	70.5	66.6	6.1	7.2	5.3	6.2	6	10	14	15	0	0	0	6	16	11	17	6	6	13	10	5	10	11.4
May ...	13	12	3	7	7	23	11	15	2	56.3	54.8	56.4	55.8	82.1	47.2	71.4	66.9	5.1	6.7	3.2	5.0	4	20	7	9	0	0	0	9	11	5	7	4	4	31	7	1	6	9.9
June ..	4	24	10	10	15	7	10	9	1	64.3	63.8	64.9	64.3	91.5	63.9	86.8	80.7	6.0	7.5	6.4	6.0	5	12	13	19	0	0	3	8	11	5	29	3	5	6	8	0	5	11.4
July ...	15	7	2	4	5	35	16	6	3	68.4	68.4	69.3	68.7	90.5	60.6	84.8	78.6	6.0	5.7	3.0	4.9	7	17	7	16	0	0	5	9	8	4	1	2	7	25	5	9	4	10.4
Aug ...	15	17	6	9	9	9	2	20	6	65.7	67.2	67.7	66.9	92.2	58.9	86.8	79.3	4.3	6.8	3.4	4.8	7	19	5	6	0	0	1	6	9	10	2	1	10	28, 29	8	0	3	4.5
Sept ...	14	14	7	9	18	5	4	8	11	63.5	68.6	67.0	66.4	93.4	62.2	86.5	80.7	4.0	5.6	3.3	4.3	9	18	3	5	0	0	0	2	3	2	1	0	7	28–30	2	7	1	3.1
Oct	9	17	9	12	6	9	4	20	7	54.2	53.2	55.5	54.3	84.9	48.5	75.4	69.6	3.0	4.2	2.9	3.4	20	5	6	5	0	0	4	0	1	1	31	0	2	19–21	0	11	0	5.6
Nov ...	10	5	8	8	10	12	12	16	9	36.8	39.4	39.4	38.5	85.8	52.0	74.7	70.7	3.3	3.3	2.9	3.2	15	10	5	4	0	4	0	0	1	10	27, 29	0	7	17	1	3	1	0.0
Dec ..	5	15	4	14	20	7	8	19	1	33.5	35.7	34.8	34.7	80.9	63.4	75.9	73.4	7.2	6.9	6.1	6.7	6	9	16	14	1	11	0	1	12	7	23	1	1	5, 6, 7	11	6	4	2.4
Sums .	122	169	79	101	136	170	98	180	43	587.5	602.6	608.2	599.5	1009.8	691.6	926.9	876.1	64.9	75.8	54.1	64.9	95	150	121	141	4	48	13	47	......		......	......		......	129	3	94	1.3
	Percentages.																					Percentages.																	
Means.	11.1	15.4	7.2	9.2	12.4	15.5	8.9	16.4	3.9	49.0	50.2	50.7	50.0	84.2	57.6	77.2	73.0	5.4	6.3	4.5	5.4	26.0	41.0	33.1	38.5	1.1	13.1	3.6	12.8	43	0	*11	0	2	†19–21	10	9.2	7	10.1

* March. † October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.27 a. m., 2.27 p. m., and 10.27 p. m., local time.

Corrections for instrumental error of barometer used: From 6.27 a. m., January 1, to 2.27 p. m., March 29, inclusive, +.003 inch; from 6.27 p. m., March 29, to 10.27 p. m., December 31, 1884, inclusive, −.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.860; February, 0.860; March, 0.850; April, 0.830; May, 0.810; June, 0.810; July, 0.800; August, 0.800; September, 0.810; October, 0.830; November, 0.850; December, 0.860.

REMARKS.—Flood in Tennessee River passed danger line (33 feet) March 8; reached highest point since 1875 (43 feet) on March 11, and subsided below danger line March 15. Heated term in October of unusual intensity; maximum temperature over 90° on 3d, 4th, 5th, and 6th. A remarkably heavy sleet storm December 21, coating exposed objects with ice one-half inch thick.

B. L. GOULDING,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHEYENNE, WYO.

Location of office on December 31, 1884, Commercial Building.

[Latitude, 41° 8′ N.; longitude, 104° 48′ W. Elevation of barometer above sea-level, 6,105 feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	23.903	23.950	23.977	23.963	24.297	20	23.602	6	.695	20.4	29.6	20.9	23.6	50.2	12	—11.0	15	61.2	33.8	12.8	.76	.48	14	48	NW.	31	NW.	10,751
Feb	23.840	23.825	23.852	23.839	24.161	26	23.287	18	.874	19.4	29.6	22.0	23.7	50.1	24	—28.2	12	78.3	33.6	18.6	.26	.15	3, 4	50	NW.	20	NW.	10,247
Mar	23.819	23.812	23.840	23.824	24.160	13	23.241	10	.919	26.3	38.7	28.4	30.8	58.9	15	1.5	6	57.4	41.8	21.2	1.59	.93	20, 21	56	NW.	27	NW.	9,974
Apr	23.909	23.912	23.931	23.918	24.242	19	23.558	13	.684	29.2	45.0	34,5	36.2	69.9	24	18.3	2	51.6	49.4	26.9	1.33	.92	25, 26	34	NW.	7	NW.	8,060
May	24.027	24.016	24.044	24.029	24.300	8	23.703	4	.597	41.7	58.8	48.3	49.6	79.8	8	22.0	1	57.8	64.7	38.6	4.83	.94	28, 29	34	NW., SE.	10 20	NW.	7,749
June	24.083	24.081	24.089	24.084	24.272	18	23.829	11	.443	50.9	73.7	58.8	61.1	93.4	27	43.2	16	50.2	78.2	49.1	1.50	.88	7	43	SW.	26	S.	6,673
July	24.101	24.081	24.092	24.091	24.288	8	23.966	21	.322	54.9	78.4	63.6	65.6	90.0	6	44.0	29	46.0	81.8	52.3	.60	.46	29	34	NW.	29	NW.	8,138
Aug	24.142	24.131	24.145	24.139	24.330	3	23.860	19	.470	51.5	72.4	59.5	61.1	86.5	31	39.7	3	46.8	75.3	49.8	2.07	.86	18, 19	36	NW.	1	NW.	6,741
Sept	24.020	23.994	24.006	24.007	24.330	19	23.662	7	.668	46.0	69.0	54.6	56.5	82.5	1	28.5	30	54.0	72.8	42.8	1.25	1.01	14, 15	45	NW.	10	NW.	8,596
Oct	24.078	24.046	24.087	24.070	24.440	16	23.653	1	.787	38.4	60.7	43.6	47.6	76.8	2	9.4	27	67.4	63.2	33.8	.50	.26	26	42	W.	5	NW.	7,473
Nov	24.064	24.052	24.084	24.067	24.300	7	23.708	21	.592	29.5	47.2	32.0	36.2	65.7	6	1.6	23	64.1	49.2	23.8	.18	.09	17	56	NW.	26	NW.	8,470
Dec	23.813	23.802	23.834	23.816	24.201	8	23.802	21	.899	16.2	25.5	14.7	18.8	61.2	1	—13.4	16	74.6	31.1	6.5	.67	.21	11	44	W.	19	W.	7,533
Sums ..	287.859	287.702	287.984	287.847	....	..	....	...	7.950	428.4	628.6	480.9	510.8	.....	.....	....	...	709.4	674.9	370.7	15.54	....	....	..	....	....	....	100,411
Means .	23.988	23.975	23.998	23.987	24.440	*16	23.241	†10	.662	35.3	52.4	40.1	42.6	93.4	‡27	—28.2	§12	59.1	56.2	30.9	.....	....	.....	...	....	....	NW.	....

* October. † March. ‡ June. § February.

CHEYENNE, WYO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	6	3	0	2	7	17	48	0	9.4	13.9	9.7	11.0	63.2	53.5	64.5	60.4	1.7	3.6	3.1	2.8	18	9	4	7	13	31	0	0	0
Feb	9	5	1	9	7	6	15	34	1	8.8	12.2	10.4	10.5	65.4	50.9	62.3	59.5	2.9	4.8	3.4	3.7	15	9	5	7	9	27	0	0	0
Mar	13	7	3	6	12	6	14	32	0	16.1	15.1	16.8	16.0	68.3	42.5	62.0	57.6	2.4	4.1	3.5	3.3	16	10	5	8	4	31	0	0	0
Apr	19	9	2	6	12	3	10	27	2	21.2	22.2	25.0	22.8	71.9	42.8	69.3	61.3	4.1	6.0	3.6	4.6	9	16	5	9	0	26	0	0	0
May	16	10	7	7	6	7	14	24	2	32.8	31.5	34.3	32.9	72.0	38.8	60.9	57.2	4.8	6.4	5.6	5.6	6	15	10	17	0	7	0	10	0
June	5	2	4	11	22	12	11	19	4	43.1	41.0	44.7	42.9	76.1	33.9	61.2	57.1	3.3	4.4	2.3	3.3	15	13	2	9	0	0	1	8	0
July	3	5	3	7	13	12	11	37	2	39.2	26.8	41.4	35.8	59.6	20.0	49.5	43.0	2.0	3.7	2.6	2.8	20	9	2	5	0	0	0	3	0
Aug	6	7	3	14	15	9	8	29	2	41.6	36.9	43.0	40.5	71.3	33.2	57.7	54.0	3.1	3.5	3.5	3.4	15	12	4	12	0	0	0	5	0
Sept	5	3	0	6	18	12	11	34	1	30.7	26.1	32.2	29.7	57.8	23.7	46.4	42.6	3.1	2.5	2.9	2.8	16	11	3	6	0	1	0	2	0
Oct	10	3	2	3	20	8	14	32	1	25.9	27.0	28.9	27.3	63.4	31.1	58.2	50.9	3.0	3.6	3.3	3.3	15	11	5	4	0	12	0	1	0
Nov	12	7	1	2	6	1	13	48	0	19.5	13.9	19.7	17.7	66.9	33.2	61.8	54.0	1.4	3.9	2.8	2.7	20	5	5	3	2	28	0	0	0
Dec	15	12	3	3	15	9	20	16	0	9.3	12.0	8.4	9.9	77.8	66.1	78.5	74.1	5.1	5.8	4.9	5.3	10	9	12	14	14	28	0	0	0
Sums ..	123	76	32	74	148	92	158	380	15	297.6	278.6	314.5	297.0	813.7	469.7	732.3	671.7	36.9	52.3	41.5	43.6	175	129	62	101	42	191	1	29	0
	Percentages.																					Percentages.								
Means .	11.2	6.9	2.9	6.7	13.5	8.4	14.4	34.6	1.4	24.8	23.2	26.2	24.7	67.8	39.1	61.0	56.0	3.1	4.4	3.5	3.7	47.8	35.3	16.9	27.6	11.5	52.2	0.3	7.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.09 a. m., 1.09 p. m., and 9.09 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11.03 p. m., December 31, 1884, inclusive, .000 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.270; February, 6.270; March, 6.200; April, 6.020; May, 5.890; June, 5.760; July, 5.710; August, 5.720; September, 5.880; October, 6.040; November, 6.230; December, 6.300.

EDGAR McGOVERN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHICAGO, ILL.

Location of office on December 31, 1884, Major Block, corner of Madison and La Salle streets.

[Latitude, 41° 52′ N.; longitude, 87° 38′ W. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 93 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.407	29.401	29.423	29.410	29.926	26	28.759	13	1.167	16.6	23.0	17.9	19.2	49.3	30	—18.5	5	67.8	26.5	11.1	1.39	.39	1, 2	26	W.	30	W.	6,713
Feb	29.304	29.280	29.298	29.294	29.758	15	28.702	19	1.056	24.8	30.5	27.7	27.7	53.0	19	— 2.8	29	55.8	35.4	20.3	3.27	1.13	12	26	W.	19	NW.	5,412
Mar	29.307	29.280	29.294	29.294	29.739	30	28.642	25	1.097	30.5	38.0	34.1	34.2	59.2	27	— .9	4	60.1	41.1	27.3	5.16	3.20	25	28	SW.	11	N.	6,168
Apr	29.236	29.220	29.231	29.229	29.653	21	28.559	15	1.094	41.1	47.4	44.4	44.3	77.2	30	31.0	2	46.3	50.7	37.9	3.05	1.74	15	36	W.	27	E.	6,364
May	29.237	29.225	29.227	29.230	29.665	29	28.784	1	.881	53.4	61.0	55.7	56.7	78.0	22	40.0	2, 7	38.0	68.9	48.3	1.53	.68	1	25	NW.	27	N.	6,016
June*	29.351	29.320	29.324	29.332	29.570	14	28.984	9	.586	62.6	68.6	63.8	65.0	86.4	23	47.0	11	39.4	71.1	57.3	2.11	.62	1, 2	23	NW.	9	N.	4,496
July	29.227	29.211	29.207	29.215	29.488	20	28.936	5	.552	66.1	73.1	68.4	69.2	89.2	22	53.8	6	35.3	75.2	62.0	3.71	1.46	23, 24	28	NE.	23	E.	4,296
Aug	29.340	29.318	29.318	29.325	29.653	9	28.973	29	.680	65.5	73.3	68.5	68.8	91.2	19	51.1	10	40.1	74.9	61.7	2.50	1.27	28	20	SW.	25	S.	4,996
Sept	29.327	29.293	29.302	29.307	29.712	13	28.810	24	.902	64.2	73.7	68.8	68.9	88.7	9	50.6	21	38.1	75.5	62.0	2.29	1.09	27	24	W.	17	S.	5,800
Oct	29.416	29.380	29.392	29.396	29.816	14	29.084	5	.732	51.6	61.5	56.1	56.4	83.4	2, 5	27.7	23	55.7	64.2	48.6	3.59	1.39	7, 8	35	N.	8	SW.	5,745
Nov	29.355	29.345	29.359	29.353	29.741	6	†28.677	23	†1.064	35.5	44.0	39.3	39.6	64.4	9	5.4	24	59.0	48.8	33.1	1.80	.82	3, 4	22	NW.	23	SW.	5,441
Dec	29.370	29.353	29.356	29.360	29.898	25	28.576	6	1.317	25.4	31.0	28.8	28.4	61.2	30	—11.2	19	72.4	37.8	22.2	4.21	.93	28, 29	29	SW.	31	S.	6,574
Sums	351.877	351.626	351.731	351.745	......	...	....	...	†11.128	536.3	625.1	573.5	578.4	....	....	......	...	608.0	665.1	491.8	34.61	....	......	...	....	...	....	68,018
Means	29.323	29.302	29.311	29.312	29.926	‡26	28.559	§15	†.927	44.7	52.1	47.8	48.2	91.2	‖19	—18.5	‡5	50.7	55.4	41.0	.....	....	......	...	....	...	SW.	......

*One 7 a. m. observation missed. †See letter received, 485, observation, 1885. ‡January. §April. ‖August.

CHICAGO, ILL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	6	4	2	3	9	28	31	10	0	9.0	13.9	8.6	10.5	71.5	67.3	66.9	68.6	6.2	6.1	3.9	5.4	9	13	9	13	18	29	0	0	0
Feb	4	16	5	5	16	7	16	17	1	16.9	21.8	18.5	18.9	71.7	68.8	67.9	69.5	6.6	8.1	6.5	7.1	4	11	14	16	8	25	0	0	0
Mar	19	12	10	5	13	7	12	18	2	22.7	26.0	24.5	24.4	72.5	62.7	67.0	67.7	6.6	6.9	6.1	6.5	4	11	16	15	9	15	0	0	0
Apr	21	11	24	4	4	5	10	11	0	33.4	32.6	33.8	33.3	74.0	58.9	69.2	67.6	5.9	6.9	4.8	5.9	9	9	12	9	0	1	0	2	0
May	24	7	10	9	16	17	6	4	0	43.9	44.8	44.5	44.4	71.9	57.1	67.6	65.5	4.8	5.6	3.3	4.6	9	17	5	10	0	0	0	2	0
June	24	11	17	6	5	6	5	9	7	55.0	56.0	56.5	55.8	75.9	65.5	77.7	73.0	6.1	5.5	3.3	5.0	9	12	8	6	0	0	0	4	0
July	13	13	15	4	11	10	13	13	1	58.2	58.1	59.0	58.4	76.2	61.0	72.6	69.9	5.3	6.2	2.5	4.7	5	25	1	12	0	0	0	6	0
Aug	7	14	18	5	19	8	10	8	4	57.5	56.5	58.1	57.4	78.2	56.6	70.0	68.3	4.2	4.3	2.1	3.5	15	12	4	9	0	0	1	2	0
Sept	7	8	14	4	22	21	12	2	0	56.7	56.6	58.8	57.4	77.4	57.4	71.1	68.6	3.9	3.6	3.6	3.7	15	9	6	8	0	0	0	1	0
Oct	8	3	7	7	15	27	20	6	0	44.6	46.7	46.5	45.9	77.1	60.0	70.9	69.3	4.4	5.1	3.1	4.2	14	11	6	10	0	1	0	2	0
Nov	9	3	5	5	10	23	17	17	1	30.4	33.7	32.2	32.1	81.6	68.1	76.3	75.3	5.7	4.9	3.9	4.8	9	14	7	9	2	9	0	1	0
Dec	0	4	2	9	21	19	19	19	0	21.0	24.1	23.2	22.8	82.8	75.6	80.4	79.6	8.1	7.2	6.9	7.4	4	9	18	18	10	20	0	0	0
Sums	142	106	129	66	161	178	171	129	16	449.3	470.8	464.2	461.3	911.4	759.0	858.5	842.9	67.8	70.4	50.0	62.8	106	153	106	135	47	100	1	20	0
	Percentages.																					Percentages.								
Means	12.9	9.7	11.7	6.0	14.7	16.2	15.6	11.7	1.5	37.4	39.2	38.7	38.4	76.0	63.2	71.5	70.2	5.6	5.9	4.2	5.2	29.0	41.9	29.0	36.9	12.8	27.3	.3	5.5	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.18 a. m., 2.18 p. m., and 10.18 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.750; February, 0.750; March, 0.740; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.740; December. 0.760.

REMARKS.—Frequent halos during first ten days of January; heavy rain February 12; heavy rain March 25; heavy snow April 20, severe gale 27; severe frost May 29; heavy frost October 23 (first frost for season); thunder-storm November 16; cold spell December 16 to 27.

T. B. JENNINGS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHIMO, FORT, UNGAVA BAY, LABRADOR.

[Latitude, 59° N.; longitude, 68° W. Elevation of barometer above sea-level, 126 feet. Elevation of exposed thermometer above ground, — feet. Elevation of rain-gauge above ground, — feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.778	29.761	29.785	29.775	30.593	27	28.440	4	2.153	−23.5	−19.6	−23.8	−22.3	17.0	10	−50.0	22	67.0	−15.5	−31.9	.78	.64	10	58	N.	8	S.	7,017
Feb	29.861	29.843	29.878	29.861	30.553	8	28.881	20	1.672	−19.3	−13.1	−18.5	−17.0	30.0	20	−35.0	(‡)	65.0	− 8.7	−25.7	.70	.17	20	58	SW.	11	SW.	10,241
Mar	29.914	29.920	29.935	29.923	30.569	27	29.087	21	1.482	−12.7	− 2.5	−11.1	− 8.8	28.0	29	−41.0	3	69.0	1.0	−21.4	1.17	.51	13	61	NW.	22	S.	8,802
Apr.	30.055	30.067	30.093	30.072	30.567	29	29.650	27	917	17.9	23.5	15.7	19.0	52.0	20	−13.0	12	65.0	26.7	7.2	.84	.39	17, 18	36	SW.	20	NE.	*4,715
May	29.863	29.861	29.867	29.864	30.429	7	29.240	3	1.189	34.7	43.4	32.7	36.0	72.0	20	10.0	1	62.0	45.6	25.5	2.02	.54	4	Gale.	SW.	27	N.	......
June	29.713	29.701	29.704	29.706	30.216	1, 13	29.212	24	1.040	40.7	46.6	38.7	42.0	74.0	17	25.0	4, 5	49.0	50.2	31.3	5.46	.91	11, 12	Gale.	NW. SW. W.	3, 12, 25, 26, 29 4, 14, 23 5, 17, 24	W.	......
July	29.835	29.820	29.838	29.831	30.425	8	29.488	1	.942	53.4	62.1	47.0	54.2	86.0	{14 15}	27.0	8	59.0	68.8	30.2	1.40	.57	28, 29	Gale.	SW.	28	N.	......
Aug†	29.739	29.723	29.731	29.781	30.108	22	29.132	10	.876	48.6	57.5	43.2	49.8	80.0	6	23.0	23	57.0	61.8	37.2	3.28	.93	1	Storm.	SW.	10	NW.	......
Sept	......	......	......	......	......	....	......	..	....	......	......	......	......	....	....	......	...	....	......	......	....	....	......	......	......	......	......	......
Oct.	......	......	......	......	......	....	......	..	....	......	......	......	......	....	....	......	...	....	......	......	....	....	......	......	......	......	......	......
Nov.	......	......	......	......	......	....	......	..	....	......	......	......	......	....	....	......	...	....	......	......	....	....	......	......	......	......	......	......
Dec	......	......	......	......	......	....	......	..	....	......	......	......	......	....	....	......	...	....	......	......	....	....	......	......	......	......	......	......
Sums	......	......	......	......	......	....	......	..	....	......	......	......	......	....	....	......	...	....	......	......	....	....	......	......	......	......	......	......
Means	......	......	......	......	......	....	......	..	....	......	......	......	......	....	....	......	...	....	......	......	....	....	......	......	......	......	......	......

* For 25 days. † For 24½ days. ‡ 3, 8, 10, 11, 18.

CHIMO, FORT, UNGAVA, LABRADOR—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	4	5	3	0	33	23	2	1	22	−28.5	−19.6	−23.8	−22.3	100.0	100.0	100.0	100.0	3.3	4.4	3.6	3.8	14	10	7	3	31	31	0	...	34
Feb	4	6	0	4	12	48	3	3	12	−19.3	−13.1	−18.5	−17.0	100.0	100.0	100.0	100.0	5.3	6.2	3.9	5.1	8	12	9	10	29	29	0	...	21
Mar	4	8	0	3	27	10	7	7	18	−12.7	− 2.5	−11.1	− 8.8	100.0	100.0	100.0	100.0	5.4	5.3	5.0	5.2	8	14	9	12	31	31	0	...	36
Apr	14	19	0	3	10	13	8	15	18	17.0	21.5	15.2	17.9	96.3	92.6	97.9	95.6	8.2	6.9	7.3	7.5	3	8	19	10	20	29	0	...	8
May	31	16	6	1	8	9	8	12	2	27.8	34.5	26.9	29.7	76.8	71.9	79.5	76.1	7.1	7.4	6.7	7.1	7	4	20	10	1	27	0	...	1
June	9	3	4	4	5	22	28	20	0	32.2	35.5	32.4	33.4	74.0	66.9	79.5	73.5	8.0	8.9	9.0	8.6	1	5	24	21	0	16	0	...	1
July	30	13	5	11	13	10	2	7	2	42.9	48.2	37.9	43.0	69.0	60.8	73.1	67.6	6.3	6.6	6.1	6.3	8	6	17	8	0	3	0	..	13
Aug	7	5	8	8	7	15	14	17	0	38.6	41.6	36.1	38.8	69.7	57.3	76.8	67.9	8.4	7.6	8.2	8.1	0	9	15	10	0	3	0	..	4
Sept																														
Oct																														
Nov																														
Dec																														
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.35 a. m., 3.35 p. m., and 11.35 p. m , local time.
Correction for instrumental error of barometer used: From 7 a. m , January 1, to 11 p. m., August 25, 1884, inclusive, —.002 inch.
Station closed August 25.

LUCIEN M. TURNER,
Observer, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHINCOTEAGUE, VA.

Location of office on December 31, 1884, Front street, near town hall.

[Latitude, 37° 55′ N.; longitude, 75° 23′ W. Elevation of barometer above sea-level, 8 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 26 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.164	30.115	30.139	30.139	30.822	27	29.262	8	1.560	30.6	35.0	32.4	32.7	54.3	24	8.0	6, 7	46.3	39.2	25.2	4.89	1.65	8	40	N.	5	NW.	9,686
Feb	30.074	30.054	30.100	30.076	30.692	16	29.213	28	1.479	40.7	43.9	41.0	41.9	58.6	18	18.0	29	40.6	48.9	35.0	5.84	1.39	23	50	NW.	1	S.	8,212
Mar	30.044	29.978	30.028	30.017	30.458	16	29.495	26	.963	40.0	45.3	41.7	42.3	61.2	20	15.0	1	46.2	49.0	35.3	7.81	1.65	23, 24	44	NW.	30	NW.	9,221
Apr	29.890	29.833	29.876	29.866	30.227	12	29.178	2	1.049	46.6	53.0	46.9	48.8	72.2	29	34.6	{ 7 10 }	37.6	55.5	41.6	1.51	.43	25, 26	45	NW.	4	NW.	9,243
May	29.979	29.938	29.957	29.958	30.315	3	29.600	11	.715	59.5	66.3	59.2	61.7	84.5	{ 22 24 }	46.2	29	38.3	70.0	53.5	1.12	.48	6, 7	32	NW.	10	S.	6,878
June	30.071	30.041	30.043	30.052	30.415	15	29.724	9	.691	67.5	74.0	65.9	69.1	88.6	22	50.1	2	38.5	77.8	61.5	3.60	1.83	13, 14	45	N.	26	S.	6,690
July	29.898	29.856	29.874	29.876	30.074	22	29.625	13	.449	71.1	77.4	71.0	73.2	94.5	24	59.5	9	35.0	80.3	66.8	5.92	1.43	1	34	NW.	24	S.	6,086
Aug	30.050	30.022	30.035	30.036	30.274	25	29.713	30	.561	71.8	77.2	70.9	78.3	90.8	20	61.2	13	29.6	79.4	67.8	1.10	.72	7	36	NW.	30	{ NE., SW. }	5,735
Sept	30.137	30.083	30.110	30.110	30.413	14	29.744	17	.669	69.2	76.6	69.5	71.8	87.8	{ 6 7 29 }	55.2	19	32.6	79.9	64.7	.83	.80	22	44	NE.	13	S.	5,832
Oct	30.175	30.112	30.149	30.145	30.584	26	29.783	8	.801	59.6	66.8	60.9	62.4	84.2	4	36.5	26	47.7	70.4	54.4	1.12	.51	22, 23	33	NE.	15	N., S.	7,309
Nov.	30.112	30.063	30.078	30.084	30.458	22	29.429	28	1.029	45.1	58.6	48.2	49.0	72.0	2	25.0	25	47.0	57.1	41.2	2.12	.86	28, 29	36	NW.	24	NW.	7,350
Dec	30.195	30.136	30.161	30.164	30.614	20	29.619	6	.995	37.9	44.2	40.4	40.8	62.2	30	9.0	20	53.2	47.4	33.6	5.75	1.34	6, 7	45	{ NW., N. }	9, 19	N.	9,182
Sums ..	360.789	360.231	360.550	360.528	....	...	....	...	10.961	639.6	713.3	648.0	667.0	....	....	......	...	492.6	754.9	580.1	41.11	....	......	...	....	....	....	91,514
Means .	30.066	30.019	30.046	30.044	30.822	*27	29.178	† 2	.918	58.3	59.4	54.0	55.6	94.5	‡ 24	8.0	{ *6 *7 }	41.0	62.9	48.3	......	...	......	...	....	....	S.	......

*January. †April. ‡July.

CHINCOTEAGUE, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number* of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	23	12	1	4	13	9	6	24	1	26.4	29.1	28.2	27.9	84.3	80.2	84.5	83.0	6.3	6.3	4.8	5.8	6	16	9	15	6	24	0	0	0
Feb	11	10	12	6	18	17	0	18	0	37.9	38.5	37.8	38.1	90.1	83.0	89.1	87.0	5.4	6.1	4.8	5.4	4	19	6	21	1	10	0	0	0
Mar	7	15	4	17	14	4	1	31	0	35.8	38.1	36.4	36.8	85.6	78.6	82.8	82.3	4.5	5.6	3.9	4.7	12	10	9	18	1	8	0	0	0
Apr	11	10	10	12	3	11	0	33	0	40.1	41.6	42.0	41.2	79.0	68.0	83.8	76.9	5.0	5.8	5.2	5.3	9	13	8	18	0	0	0	0	0
May	7	7	5	12	23	22	2	15	0	53.5	53.2	55.0	53.9	81.5	65.1	86.5	77.7	3.7	4.5	4.7	4.3	12	13	6	7	0	0	0	0	0
June.....	1	13	11	15	29	14	3	4	0	64.4	64.4	63.2	64.0	90.3	74.4	91.4	85.4	4.2	5.4	3.6	4.4	10	14	6	10	0	0	0	0	0
July.....	13	1	6	10	28	15	3	17	0	66.9	66.8	68.3	67.3	87.7	71.7	91.7	83.7	5.5	5.9	5.5	5.6	5	19	7	18	0	0	1	5	0
Aug	6	21	9	20	9	21	3	4	0	70.1	69.4	69.2	69.6	94.6	78.1	94.8	89.2	6.7	6.0	5.1	5.9	5	16	10	9	0	0	1	3	0
Sept.....	8	10	3	11	30	21	2	4	1	65.0	64.3	63.9	64.4	87.0	67.0	83.6	79.2	2.3	3.1	2.0	2.5	18	11	1	2	0	0	0	0	0
Oct	21	9	5	13	21	8	2	13	1	53.5	51.7	55.5	54.6	81.3	66.9	83.3	77.2	3.6	3.8	3.2	3.5	14	13	4	7	0	0	0	0	0
Nov	20	15	2	10	6	12	3	22	0	40.6	42.4	42.2	41.7	84.7	68.2	80.8	77.9	2.9	3.1	3.7	3.2	18	6	6	10	0	4	0	0	0
Dec	23	19	2	7	5	18	5	13	1	33.3	37.2	35.8	35.4	83.8	77.9	84.7	82.1	6.6	6.2	5.8	6.2	5	14	12	19	3	9	0	0	0
Sums ..	151	142	70	137	199	172	30	193	4	587.5	599.7	597.5	594.9	1,029.9	879.7	1,037.0	982.2	56.7	61.8	52.3	56.8	118	164	84	149	11	55	2	8	0
	Percentages.																					Percentages.								
Means.	13.8	12.9	6.4	12.5	18.1	15.7	2.7	17.6	4.4	49.0	50.0	49.8	49.6	85.8	73.3	86.4	81.8	4.7	5.2	4.4	4.8	32.2	44.8	23.0	40.7	3.0	15.0	0.5	2.2	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.07 a. m., 3.07 p. m., and 11.07 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—No remarkable meteorological phenomena occurred during the year. The elevation of station barometer was changed on the night of the 31st of May, after the 11 p. m. observations; authority, letter dated Office Chief Signal Officer, May 24, 1884.

CHAS. F. DICKENS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CINCINNATI, OHIO.

Location of office on December 31, 1884, Pike's Opera House, West Fourth street.

[Latitude, 39° 6′ N.; Longitude, 84° 30′ W. Elevation of barometer above sea-level, 620 feet. Elevation of exposed thermometer above ground, 68 feet. Elevation of rain-gauge above ground, 76 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.‖				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan*	29.559	29.511	29.538	29.506	30.092	26	29.000	1	1.092	22.8	31.1	26.2	26.7	59.7	31	—9.7	5	69.4	33.9	18.8	2.21	0.49	18, 19	24	SW.	2	SW.	4,542
Feb	29.406	29.366	29.387	29.386	29.883	15	28.738	19	1.145	37.9	45.4	40.4	41.2	66.9	12	6.4	29	60.5	50.0	33.8	3.87	2.50	5, 6	25	W.	9	NW.	4,213
Mar	29.385	29.357	29.366	29.369	29.770	9 30	28.830	28	.940	40.6	49.6	45.3	45.2	71.8	28	13.9	4	57.9	51.8	39.1	2.63	0.81	11, 12	21	W.	11	E.	4,682
Apr	29.2[illegible]3	29.267	29.279	29.280	29.544	29	28.639	2	.885	48.1	58.4	52.3	52.9	80.0	30	34.7	9	45.3	60.0	46.2	3.02	1.02	22	23	W.	15	W.	4,619
May	29.348	29.305	29.323	29.325	29.671	29	28.988	19	.683	58.8	70.6	62.9	64.1	85.0	22	43.6	29	41.4	71.7	57.3	5.56	1.43	4	23	NW.	2	N.	4,045
June	29.408	29.360	29.379	29.382	29.645	16	28.992	10	.653	69.4	80.8	73.6	74.6	93.1	22	58.8	11	34.3	82.1	67.9	2.77	0.69	9, 10	17	SW.	9	E., SE., S.	3,078
July	29.311	29.274	29.289	29.291	29.542	21	29.001	31	.451	71.1	82.9	75.6	76.6	91.0	24	62.7	21	28.3	83.6	69.8	1.73	0.61	28	20	W.	3	W.	3,396
Aug	29.440	29.382	29.406	29.409	29.639	9	29.052	29	.587	68.3	82.8	74.2	75.1	91.5	17	59.3	9	32.2	83.0	67.5	2.05	0.87	21	18	SW.	3	NE., W.	3,165
Sept	29.465	29.408	29.444	29.439	29.722	14	29.143	28	.579	67.4	80.5	72.8	73.6	91.3	11	55.2	21	36.1	81.4	66.8	3.87	1.31	24	21	SW.	28	SW.	3,210
Oct	29.543	29.491	29.512	29.515	29.840	15	29.226	8	.614	55.4	68.5	59.9	61.8	87.7	3, 5	31.0	24	56.7	69.8	54.0	1.35	0.55	27	20	SW.	21	SE., W.	3,300
Nov	29.471	29.444	29.464	29.460	29.848	6	28.871	23	.977	39.8	50.0	43.1	44.3	66.3	10	18.6	24	47.7	53.4	36.5	1.23	0.52	23	23	W.	23	W.	3,951
Dec	29.403	29.456	29.487	29.479	29.982	19	28.731	6	1.251	33.3	40.1	34.8	36.1	55.9	31	—2.8	19	58.7	44.0	28.3	3.99	1.27	11, 12	25	W.	6	E.	4,015
Sums	353.122	352.621	352.874	352.871	......	...	....	...	9.857	612.9	740.7	661.3	671.7	...	....	....	...	578.5	764.7	586.0	39.28	....	....	...	....	....	.....	46,816
Means	29.427	29.385	29.406	29.406	30.092	†26	28.659	‡2	.821	51.1	61.7	55.1	56.0	93.1	§22	—9.7	†5	48.2	63.7	48.8	....	....	....	...	....	....	W.	......

* 30 days. One 11 p. m. observation taken late. † January. ‡ April. § June. ‖ All wind movement should be increased 40 per cent. before using. (See 10138, Sig. 1885.)

CINCINNATI, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 a. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan*	8	7	5	10	10	26	11	13	2	18.0	24.2	20.8	21.0	81.7	75.9	80.1	79.2	5.8	6.4	4.8	5.7	11	7	12	14	12	24	0	0	38	11	1	15	5	13	23	6	24	5.5
Feb	11	6	7	13	11	13	8	14	4	33.1	36.7	34.9	34.9	82.7	72.3	80.8	78.6	6.3	7.0	7.2	6.8	4	11	14	18	2	10	0	1	71	0½	14	26	2	29	44	10½	54	5.4
Mar	8	12	16	14	10	4	13	15	1	34.2	34.3	35.7	34.7	78.3	59.0	70.3	69.2	7.3	6.9	5.8	6.7	4	13	14	17	4	9	0	2	49	8	17	17	11	7	31	9	36	9.0
Apr	9	10	15	7	8	3	21	12	5	40.0	39.2	43.6	40.9	74.5	52.2	73.3	66.7	6.3	7.3	4.5	6.0	8	8	14	14	0	0	0	4	31	8	6	17	8	16, 22	14	0	24	6.4
May	19	5	8	10	15	11	14	9	2	50.6	49.2	53.1	51.0	74.9	48.6	71.1	64.9	5.0	5.4	3.2	4.5	10	16	5	15	0	0	0	11	22	5	16	12	7	31	9	10	17	5.6
June	7	12	15	15	15	8	4	1	13	62.4	62.5	63.9	62.9	78.8	56.0	72.4	69.1	5.2	6.3	4.6	5.4	9	13	8	11	0	0	6	5	15	4	18	8	0	28	7	4	11	3.7
July	16	6	8	3	15	10	24	9	2	61.6	58.7	63.1	61.1	72.7	45.3	65.5	61.2	5.1	5.7	4.4	5.1	9	14	8	9	0	0	2	3	15	5	1	4	10	26, 27	10	7	8	5.8
Aug	12	15	7	10	8	13	15	7	6	59.2	55.6	60.3	58.4	73.3	40.6	62.4	58.8	2.9	4.7	2.7	5.4	16	11	4	7	0	0	2	3	12	10	6	4	5	26, 27	8	5	6	6.2
Sept	4	13	6	15	17	19	10	5	1	59.3	58.6	61.4	59.8	75.8	49.7	68.5	64.7	5.4	5.4	3.3	4.7	10	11	9	10	0	0	3	4	4	5	1	2	6	26	1	11	3	5.5
Oct	9	11	10	12	7	11	12	10	11	49.9	48.2	50.3	49.5	82.0	50.3	71.3	67.9	2.9	3.8	2.0	2.9	18	9	4	10	0	1	0	1	5	1	14	2	11	31	2	2	3	10.7
Nov	12	5	10	6	16	17	20	4	0	35.9	38.1	36.4	36.8	86.1	65.4	77.7	76.4	4.6	5.0	4.4	4.7	12	9	9	8	1	6	0	0	6	1	9	3	0	1–5	3	1	4	4.9
Dec	12	9	16	13	13	6	15	9	0	27.4	30.6	28.2	28.7	78.8	69.5	76.7	75.0	7.7	7.8	7.3	7.6	3	10	18	18	7	17	0	0	20	11	28	4	5	1	16	6	12	3.0
Sums	127	111	123	128	145	141	167	108	47	531.6	535.9	551.7	539.7	939.6	684.8	870.1	831.7	64.5	71.7	54.2	63.5	114	132	119	151	26	67	13	34	......		...	......		....	173	11½	207	11.7
	Percentages.																					Percentages.																	
Means	11.6	10.1	11.2	11.7	13.2	12.8	15.2	9.8	4.3	44.3	44.7	46.0	45.0	78.3	57.1	72.5	69.3	5.4	6.0	4.5	5.3	31.2	36.2	32.6	41.3	7.1	18.3	3.6	9.3	71	0½	†14	2	6	‡26	14	6	17	4.0

* One 11 p. m. observation taken late. † February. ‡ September.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.30 a. m., 2.30 p. m., and 10.30 p. m., local time.

Correction for instrumental error of barometer used: From 6.30 a. m., January 1 to 10.30 p. m., December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.690; February, 0.690; March, 0.690; April, 0.670; May, 0.650; June, 0.650; July, 0.640; August, 0.640; September, 0.650; October, 0.660; November, 0.690; December, 0.700.

REMARKS.—January 5, Coldest day of year; February 14, greatest flood ever known, immense losses; April 8, last snow; May 19, last frost; October 24, first killing frost; November 8, first light frost; November 17, first snow; December 25 to 29, navigation stopped by floating ice in river.

L. DUNNE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CLEVELAND, OHIO.

Location of office on December 31, 1884, National Bank Building, corner of Superior and Water streets.

[Latitude, 41° 30′ N., longitude, 81° 42′ W. Elevation of barometer above sea-level, 690 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 73 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total amount.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.371	29.330	29.367	29.356	29.954	27	28.714	2	1.240	16.6	22.3	18.9	19.3	51.8	30	—13.0	5	64.8	27.0	10.5	1.55	.39	30	38	SW.	2	S., SW.	9,017
Feb	29.285	29.265	29.258	29.269	29.789	15	28.501	19	1.288	27.7	30.8	30.3	29.6	64.2	13	— 3.5	29	67.7	39.7	22.9	5.27	1.53	4, 5	39	SW.	20	NE.	6,880
Mar	29.283	29.267	29.269	29.273	29.666	30	28.674	26	.992	30.7	36.3	33.9	33.6	64.8	25	— 1.5	1	66.3	40.9	26.0	1.87	.55	11, 12	32	W.	12	NE.	7,006
Apr	29.200	29.180	29.190	29.190	29.579	21	28.517	2	1.062	40.3	46.7	43.5	43.5	75.9	30	27.0	7	48.9	51.6	36.5	1.75	.99	1, 2	33	SW.	15	NE.	6,979
May	29.225	29.197	29.212	29.211	29.567	29	28.819	19	.748	54.7	62.2	56.2	57.7	83.8	22	38.0	29	45.8	66.4	49.2	3.60	1.42	19, 20	37	W.	2	SW.	6,890
June	29.345	29.308	29.312	29.322	29.638	15	28.926	9	.712	65.8	72.5	67.3	68.5	84.0	24	51.1	15	32.9	76.5	59.3	3.29	2.52	9, 10	26	NE.	13	NE.	4,999
July	29.185	29.167	29.168	29.173	29.392	21	28.907	31	.485	65.8	72.3	68.8	69.0	86.3	23	53.7	3	32.6	75.7	61.6	5.13	2.25	26, 27	36	W.	23	N.	5,656
Aug	29.327	29.301	29.310	29.313	29.569	9	28.956	28	.613	64.0	73.7	67.0	68.2	88.8	3	50.0	11	38.8	77.2	60.1	1.65	.93	28, 29	24	S.	3	SE.	5,572
Sept	29.359	29.330	29.344	29.344	29.714	14	29.024	24	.690	62.9	72.9	66.0	67.3	89.4	3	41.8	21	47.6	70.4	59.6	3.76	1.28	28	40	SW.	24	S.	6,218
Oct	29.412	29.384	29.383	29.393	29.748	25	29.020	8	.728	51.8	60.3	55.1	55.7	84.4	4	27.3	24	57.1	65.3	47.9	1.97	.50	8	32	S.	22	S.	7,006
Nov	29.323	29.302	29.338	29.321	29.637	3, 6	28.732	23	.905	35.9	42.9	37.5	38.8	67.9	1	12.3	24	55.6	47.3	31.4	1.59	.51	23	35	W.	28	S.	7,794
Dec	29.359	29.331	29.367	29.352	29.879	22	28.605	6	1.274	27.9	33.0	29.1	30.0	61.7	30	— 4.6	19	66.3	37.4	22.8	1.83	.83	11, 12	40	W.	45	SE., W.	9,598
Sums	351.674	351.362	351.518	351.517	....	...	....	...	10.737	544.1	625.9	573.6	581.2	......	...	......	...	624.4	681.4	487.8	33.26	....	......	...	....	....	....	83,615
Means	29.306	29.280	29.293	29.298	29.954	*27	28.501	†19	.895	45.3	52.2	47.8	48.4	89.4	‡3	—13.0	*5	52.0	56.8	40.6	......	....	......	...	....	....	S.	......

* January.

† February.

‡ September.

CLEVELAND, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	12	5	5	4	22	22	18	5	0	12.0	15.9	13.9	13.9	81.9	76.8	81.0	79.9	7.2	7.8	5.8	6.9	2	15	14	14	18	29	0	0	0
Feb	11	19	2	11	11	7	15	11	0	24.3	25.2	26.4	25.3	87.5	81.1	85.7	84.8	8.4	8.0	7.2	7.9	0	14	15	24	7	24	0	0	0
Mar	10	18	6	8	13	10	15	13	0	25.6	27.1	27.2	26.6	82.3	71.8	77.3	77.1	6.6	6.9	6.1	6.5	4	15	12	19	9	20	0	2	0
Apr	11	24	4	13	1	8	10	18	1	32.3	33.0	33.4	32.9	75.1	61.3	70.1	68.8	5.9	5.5	4.8	5.4	7	11	12	8	0	6	0	1	0
May	14	11	4	11	11	19	16	7	0	45.1	45.7	46.3	45.7	70.9	57.7	70.8	66.5	5.2	4.7	4.3	4.7	13	8	10	17	0	0	0	6	0
June	11	23	18	20	8	2	1	4	3	57.4	57.4	57.2	57.3	75.2	61.1	71.3	69.2	3.7	3.8	1.5	3.0	17	12	1	4	0	0	0	1	0
July	17	14	7	8	5	11	16	15	0	56.6	56.5	57.2	56.8	73.0	59.0	67.8	66.6	4.9	4.1	3.4	4.1	11	16	4	11	0	0	0	6	0
Aug	13	9	13	17	15	8	7	11	0	56.2	57.3	58.1	57.2	76.0	58.5	74.0	69.5	3.0	4.2	2.2	3.1	17	12	2	6	0	0	0	0	0
Sept	12	5	4	19	26	10	8	6	0	54.6	55.5	55.1	55.1	75.5	57.6	69.8	67.6	4.0	4.6	4.4	3.7	13	14	3	11	0	0	0	4	0
Oct	10	5	9	9	26	11	15	8	0	43.9	44.7	44.7	44.4	76.2	58.7	69.5	68.1	4.8	6.2	3.1	4.7	10	15	6	10	0	3	0	2	0
Nov	10	2	3	12	26	12	15	10	0	31.1	33.5	31.3	32.0	83.5	71.0	78.4	77.6	6.3	6.8	5.6	6.2	6	11	13	12	1	16	0	0	0
Dec	3	3	6	23	16	15	23	4	0	23.8	25.6	24.6	24.7	84.9	75.0	83.6	81.2	7.2	7.6	7.5	7.4	3	11	17	22	10	23	0	0	0
Sums	134	138	81	155	180	135	159	112	4	462.9	477.4	475.4	471.9	942.0	789.6	899.3	876.9	67.2	70.2	53.9	63.6	103	154	109	158	45	121	0	22	0
	Percentages.																					Percentages.								
Means	12.2	12.6	7.4	14.1	16.4	12.3	14.5	10.2	0.4	38.6	39.8	39.6	39.3	78.5	65.8	74.9	73.1	5.6	5.8	4.5	5.3	28.1	42.1	29.8	43.2	12.3	33.1	0	6.0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

Correction for instrumental error of barometer used: From 6.41 a. m., January 1, to 10.41 p. m., December 31, 1884, inclusive, —.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.790; March, 0.780; April, 0.760; May, 0.730; June, 0.730; July, 0.720; August, 0.720; September, 0.720; October, 0.740; November, 0.770; December, 0.790.

REMARKS.—Lake frozen January 3, 1884; lake frozen entire month of February. March, lake free from ice on 27th. First vessel of season arrived March 27. April, last snow of season on 8th; last frost of season in city April 19. May 29 frost reported by person living out of town; June, July, August, and September, very pleasant months; September 19, earthquake at 2.47 p. m.; duration about five seconds; October 15, first light frost of season; first snow of season, October 23, and first killing frost, October 24; November about normal in all respects; December, river frozen over on 1st; lake frozen 20th. Last vessel of season (Professor Schnoor, stone laden from the islands) arrived on 15th. Temperature about normal; precipitation below the average. Month cloudy and windy.

WILLIAM LINE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

COLUMBUS, OHIO.

Location of office on December 31, 1884, corner Broad and High streets.

[Latitude, 39° 58′ N.; longitude, 83° 0′ W. Elevation of barometer above sea-level, 805 feet. Elevation of exposed thermometer above ground, 52 feet. Elevation of rain-gauge above ground, 70 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.304	29.255	29.293	29.284	29.852	26	28.751	1	1.101	16.5	24.4	20.6	20.5	48.5	30	—20.3	6	68.8	27.7	12.2	2.25	.64	18, 19	38	SW.	2	S.	6,457
Feb	29.172	29.144	29.156	29.157	29.656	15	28.510	19	1.146	33.1	39.7	36.5	36.5	62.5	19	0.	29	62.5	44.9	29.5	4.95	1.44	5, 6	38	SW.	20	SW.	5,920
Mar	29.165	29.140	29.148	29.151	29.530	10	28.593	25	.937	34.8	43.5	39.7	39.3	66.9	28	6.0	4	60.9	46.4	32.0	3.59	1.12	18, 19	31	SW.	26	SW.	[1]6,111
Apr	29.074	29.044	29.070	29.063	29.379	29	28.425	2	.954	43.0	54.9	49.0	49.0	77.0	30	30.0	3	47.0	58.2	40.5	2.11	1.06	1	34	SW.	15	W.	6,424
May	29.134	29.082	29.107	29.108	29.455	29	28.758	6	.697	55.9	68.0	59.6	61.2	85.5	22	39.0	29	46.5	70.9	52.5	3.79	1.16	4	32	W.	2	W.	5,417
June......	29.212	29.161	29.187	29.187	29.457	16	28.824	9	.633	67.4	80.0	70.7	72.7	92.0	22	55.0	15	37.0	82.6	63.2	2.59	.97	24, 25	22	SW.	8	NE.	3,739
July	29.089	29.051	29.070	29.070	29.328	21	28.868	31	.460	68.2	80.5	71.6	73.4	89.0	11 22	55.3	9	33.7	82.7	64.8	2.16	1.23	28, 29	28	SW., W.	5	SW. W.	4,358
Aug	29.228	29.167	29.194	29.196	29.423	8	28.853	29	.570	65.1	81.7	71.4	72.7	92.0	20	51.4	11	40.6	82.7	62.8	.70	.55	28, 29	29	SW.	3	SW.	3,612
Sept	29.263	29.195	29.235	29.231	29.554	14	28.950	28	.604	63.2	79.4	69.3	70.6	92.0	8	46.0	21	46.0	80.7	61.4	3.46	1.26	28	30	SW. W.	24 28	SW.	3,679
Oct	29.323	29.271	29.291	29.298	29.626	15	28.982	8	.644	52.3	65.1	56.8	58.1	87.0	3	28.8	24	58.2	67.8	50.0	1.66	.68	27	28	SW.	8	W.	4,451
Nov	29.241	29.201	29.230	29.224	29.594	6	28.673	28	.921	35.6	46.4	40.1	40.7	64.6	10	15.3	24	49.3	50.2	32.7	.99	.65	23	42	SW.	23	SW.	5,277
Dec	29.263	29.227	29.254	29.248	29.742	19	28.502	6	1.240	29.3	35.2	31.1	31.9	59.6	5	—7.9	19	67.5	40.3	24.1	2.77	.78	6	43	W.	7	S.	[2]6,282
Sums ..	350.468	349.938	350.285	350.214	....	...	....	...	9.907	564.4	698.8	616.4	626.5	....	....	....	..	618.0	735.1	525.7	31.02	....	....	...	....	....	....	[3]61,727
Means .	29.206	29.162	29.176	29.181	29.852	[4]26	28.425	[5]2	.826	47.0	58.2	51.4	52.2	92.0	[6]22 [7]20 [8]8	—20.3	[4]6	51.5	61.3	43.8	.....	....	....	...	....	....	SW.	......

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[1] Anemometer frozen March 8, from 2 to 7.45 a. m., about 40 miles lost.

[2] Anemometer frozen December 12 and 21, about 56 miles lost.

[3] Anemometer frozen—record incomplete.

[4] January.

[5] April.

[6] June.

[7] August.

[8] September.

COLUMBUS, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	4	1	4	5	33	24	7	15	0	11.5	15.5	15.0	14.0	80.3	68.7	78.5	75.8	7.1	7.2	6.0	6.8	6	8	17	18	17	29	0	0	0
Feb	7	9	7	16	11	19	8	10	0	27.5	30.7	30.4	29.5	79.5	70.6	78.0	76.0	6.7	7.8	6.0	6.8	3	15	11	19	2	13	0	0	0
Mar	10	18	8	8	11	21	12	10	0	27.4	30.1	30.2	29.2	74.3	61.5	69.5	68.4	7.7	7.5	6.3	7.2	3	11	17	18	5	12	0	2	0
Apr	12	13	8	10	7	13	20	6	1	34.8	38.8	39.0	37.5	73.1	57.0	69.3	66.5	6.1	6.8	5.7	6.2	6	10	14	15	0	2	0	3	0
May	10	5	5	8	14	18	21	16	1	47.3	47.7	49.9	48.3	73.3	51.5	71.4	65.4	3.9	5.4	3.7	4.3	12	15	4	11	0	0	0	5	0
June	13	17	11	12	16	7	4	3	7	59.3	59.3	60.5	59.7	75.6	51.5	70.9	66.0	3.8	5.7	4.5	4.7	10	13	7	9	0	0	5	5	0
July	11	12	5	8	8	18	18	17	1	58.2	56.1	58.3	57.5	71.4	45.0	63.7	60.0	5.1	5.1	2.8	4.3	10	16	5	9	0	0	0	0	0
Aug	16	10	3	7	11	19	17	10	0	56.6	55.6	58.0	56.7	74.5	42.6	63.4	60.2	3.8	5.0	2.4	3.7	14	13	4	6	0	0	4	1	0
Sept	7	10	5	8	24	26	8	6	1	57.3	61.1	59.1	59.2	81.2	55.6	70.6	69.1	4.1	5.3	2.5	4.0	13	13	4	10	0	0	3	1	0
Oct	9	9	2	9	14	14	19	16	1	47.2	49.0	48.1	48.1	83.1	59.0	73.6	71.9	3.6	5.0	2.2	3.6	13	13	5	5	0	1	0	0	0
Nov	11	6	4	2	16	23	19	6	3	32.5	34.4	32.8	33.2	88.4	65.2	75.3	76.3	4.7	5.4	4.7	4.9	10	10	10	6	1	10	0	0	0
Dec	13	8	10	14	23	7	15	8	0	26.0	28.2	26.2	26.8	87.5	76.5	82.1	82.0	8.1	7.6	6.6	7.4	4	10	17	14	7	22	0	0	0
Sums	123	108	72	97	188	204	168	123	15	485.6	506.5	507.5	499.7	942.2	704.7	866.3	837.6	64.7	73.8	53.4	63.9	104	147	115	140	32	89	12	17	0
	Percentages.																					Percentages.								
Means	11.2	9.8	6.6	8.8	17.1	18.6	15.3	11.2	1.4	40.5	42.2	42.3	41.7	78.5	58.7	72.2	69.8	5.4	6.2	4.4	5.3	28.4	40.2	31.4	38.3	8.7	24.3	3.3	4.6	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m. December 31, 1884, inclusive, —.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.900; February, 0.900; March, 0.890; April, 0.870; May, 0.840; June, 0.840; July, 0.830; August, 0.830; September, 0.840; October, 0.860; November, 0.890; December, 0.910.

REMARKS.—Date of last frost in spring, May 30, 1884; date of first frost in fall, October 15, 1884; date of first killing frost in fall, November 7, 1884. Summer months very dry. Earthquake at 2.42 p. m., local time, September 19, 1884.

F. T. WILLIAMS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CONCHO, FORT, TEX.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 31° 25′ N.; longitude, 100° 24′ W. Elevation of barometer above sea-level, 1,900 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.333	28.277	28.311	28.307	28.715	1	27.761	10	.954	30.0	48.2	36.1	38.1	72.0	9	4.0	5	68.0	50.8	27.0	1.26	.58	16, 17	40	N.	10	S.	7,186
Feb	28.152	28.117	28.139	28.136	28.467	19	27.686	18	.781	39.5	58.0	46.2	47.9	79.5	26	17.3	18	62.2	62.2	35.9	.48	.26	12	48	W.	16	S.	7,421
Mar	28.090	28.027	28.064	28.060	28.469	14	27.658	10	.811	45.7	71.0	54.5	57.1	85.7	6	27.0	2	58.7	73.8	44.0	.76	.55	16, 17	48	W.	27	S.	8,658
Apr	28.053	28.028	28.034	28.038	28.379	2	27.710	28	.669	49.7	72.1	57.9	59.9	93.4	25	33.3	20	60.1	75.5	46.8	5.64	2.60	29	40	W.	14	NE.	7,140
May	28.076	28.058	28.067	28.067	28.382	8	27.797	20	.585	59.1	78.8	65.0	67.6	95.5	18	45.9	9	49.6	81.7	56.0	13.50	3.49	27	42	NW.	20	S.	7,032
June	28.096	28.077	28.084	28.086	28.243	28	27.904	6	.339	67.9	89.8	74.6	77.4	99.7	30	54.3	4	45.4	91.8	64.8	2.09	1.05	2	36	W.	2	E.	5,064
July	28.088	28.051	28.053	28.064	28.232	6	27.905	16	.327	75.0	99.0	81.9	85.3	107.7	11	68.0	{10 {18	39.7	101.5	72.2	2.37	2.25	17, 18	34	N.	17	S.	6,900
Aug	28.148	28.107	28.118	28.124	28.288	4	27.932	1	.356	70.9	93.6	79.0	81.2	102.9	1	59.9	31	43.0	96.4	69.2	1.20	1.16	20	32	NE.	19	S.	6,170
Sept	28.105	28.064	28.093	28.087	28.340	20	27.811	23	.529	69.0	89.3	76.0	78.1	99.0	6	62.2	1	36.8	91.6	68.4	3.60	3.28	10, 11	35	W.	5	S.	5,876
Oct	28.221	28.177	28.212	28.203	28.452	23	27.956	26	.496	56.6	75.6	63.0	65.1	91.8	5	40.8	25	51.0	78.0	55.5	5.49	2.25	24, 25	28	S.	1	S.	5,681
Nov	28.246	28.211	28.246	28.234	28.597	6	27.860	22	.737	44.0	61.5	49.3	51.6	77.5	8	26.4	24	51.1	64.1	41.8	1.95	1.24	10, 11	36	SW., N.	22 27	S.	5,229
Dec	28.123	28.078	28.125	28.109	28.604	31	27.716	4	.888	33.8	50.9	38.9	41.2	74.9	2	8.4	25	66.5	55.3	31.0	3.57	1.79	10	34	W., SW.	4 21	NE.	7,183
Sums ..	337.731	337.272	337.546	337.515	....	...	....	...	7.472	641.2	887.8	722.4	750.5	......	....	....	...	632.1	922.7	612.6	41.91	....	......	...	....	....	....	79,580
Means .	28.144	28.106	28.129	28.126	28.715	*1	27.658	†10	.623	53.4	74.0	60.2	62.5	107.7	‡11	4.0	*5	52.7	76.9	51.0	.....	....	......	...	....	....	S.	......

*January. †March. ‡July.

CONCHO, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	12	1	5	21	17	8	8	12	25.8	29.6	29.9	28.4	85.3	55.3	80.5	73.7	4.5	4.9	3.3	4.2	13	10	8	7	2	23	0	0	0
Feb	9	17	4	3	18	13	14	6	3	35.2	36.3	36.4	36.0	86.0	53.6	72.4	70.7	5.9	5.5	3.8	5.1	12	6	11	6	1	7	0	2	0
Mar	1	15	10	5	30	7	15	6	4	39.3	37.3	39.7	38.8	78.5	31.5	59.0	56.3	5.2	5.3	2.6	4.4	12	14	5	4	0	5	0	5	0
Apr	5	21	9	4	16	5	11	9	10	43.0	41.5	45.7	43.4	79.6	38.2	65.5	61.1	4.2	4.7	2.4	3.8	13	14	3	10	0	0	1	4	0
May	7	15	16	11	19	11	6	5	3	55.9	56.1	58.2	56.7	89.4	48.5	79.5	72.5	4.1	4.7	2.6	3.8	10	18	3	15	0	0	4	13	0
June	2	7	23	22	18	5	3	5	5	63.5	63.8	65.6	64.3	86.0	43.0	74.7	67.9	3.5	3.7	2.5	3.2	14	14	2	6	0	0	21	5	0
July	1	6	12	16	50	4	0	2	2	65.1	60.6	60.4	62.0	72.3	29.4	50.0	50.6	1.9	1.9	.8	1.5	25	4	2	3	0	0	30	3	0
Aug	0	15	17	16	34	5	0	3	3	62.4	58.5	59.1	60.0	75.5	31.9	51.7	53.0	2.4	3.9	1.6	2.6	20	9	2	2	0	0	30	2	0
Sept	1	8	7	13	47	2	2	0	10	64.5	62.6	64.2	63.8	86.1	43.3	68.8	66.1	3.6	5.8	3.2	4.2	12	13	5	7	0	0	18	5	0
Oct	6	18	4	16	29	4	5	2	9	58.4	56.5	55.0	55.0	88.9	53.9	76.3	73.0	4.3	4.7	2.5	3.8	12	12	7	6	0	0	3	1	0
Nov	8	8	4	3	25	12	8	9	13	41.8	46.8	45.2	44.6	92.0	60.1	85.5	79.2	4.1	4.4	2.6	3.7	14	11	5	6	0	3	0	2	0
Dec	9	22	9	4	6	19	12	7	5	30.5	32.7	33.1	32.1	87.6	56.5	80.9	75.0	5.0	5.8	4.0	4.9	12	10	9	5	4	14	0	3	0
Sums ..	58	164	116	118	313	104	84	62	79	580.4	582.3	592.5	585.1	1007.2	545.2	844.8	799.1	48.7	55.3	31.9	45.2	169	135	62	77	7	52	107	45	0
	Percentages.																					Percentages.								
Means .	5.3	14.9	10.6	10.7	28.5	9.5	7.7	5.6	7.2	48.4	48.5	49.4	48.8	83.9	45.4	70.4	66.6	4.1	4.6	2.7	3.8	46.2	36.9	16.9	21.0	1.9	14.3	29.2	12.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.27 a. m., 1.27 p. m., and 9.27 p. m., local time.
Correction for instrumental error of barometer used: From 5.27 a. m., January 1, to 9.27 p. m., December 31, 1884, both inclusive, +.002 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.030; February, 2.020; March, 1.970; April, 1.940; May, 1.900; June, 1.870; July, 1.880; August, 1.860; September, 1.900; October, 1.950; November, 2.010; December, 2.030.

V. E. KING,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CUSTER, FORT, MONT.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 45° 42′ N.; longitude, 107° 34′ W. Elevation of barometer above sea-level, 3,040 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Month.	Barometer readings (corrected for temperature and instrumental errors only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	26.899	29.890	26.898	26.896	27.391	1	26.473	8	.918	8.9	19.2	15.7	14.6	49.0	12	—17.0	1, 4	66.0	26.6	2.8	2.85	1.12	30, 31	36	W.	8	N.	4,525
Feb	26.806	26.806	26.837	26.816	27.285	26	26.030	17	1.255	2.8	12.0	7.0	7.3	47.0	24	—31.0	11	78.0	16.9	—2.8	1.29	.36	27, 28	36	NW.	23	N.	4,210
Mar	26.739	26.731	26.742	26.737	27.076	14	26.119	10	.957	19.1	32.0	25.6	25.6	60.0	26	—13.0	8	73.0	36.8	15.9	1.02	.30	5	23	W.	11	SE.	4,702
Apr	26.809	26.773	26.787	26.790	27.224	18	26.379	12	.845	33.1	52.8	43.4	43.1	74.0	24	18.5	6	55.5	57.3	31.3	.77	.38	29, 30	32	N.	18	N., E.	5,543
May	26.822	26.796	26.817	26.812	27.132	29	26.434	3	.698	43.1	65.7	55.0	54.6	84.0	25	24.5	1	59.5	70.5	41.5	1.19	.48	15	31	W.	4	SE.	5,444
June	26.787	26.753	26.761	26.767	27.009	18	26.541	26	.468	55.5	77.6	66.5	66.5	94.3	26	46.0	1	48.3	82.6	53.7	3.87	2.06	11, 12	32	SW.	23	E.	4,400
July	26.816	26.784	26.789	26.796	26.971	30	26.441	31	.530	55.7	78.6	69.0	67.8	93.3	31	43.1	5	50.2	84.3	54.3	.80	.27	26, 27	36	E.	3	E.	5,280
Aug	26.862	26.838	26.838	26.846	27.098	3	26.615	1	.483	54.7	80.4	67.9	67.7	100.0	14	42.8	3	57.2	85.5	52.9	2.09	1.35	19	52	NW.	15	E.	4,750
Sept	26.782	26.757	26.760	26.766	27.088	19	26.394	1	.694	45.1	63.0	54.0	54.0	85.0	20	31.0	30	54.0	68.0	42.0	1.42	.61	14, 15	36	NW.	3	N.	4,603
Oct	29.840	26.803	26.842	26.828	27.217	16	26.227	1	.990	38.6	59.7	47.0	48.4	84.1	18	20.3	27	63.8	64.0	34.7	.66	.32	2, 3	36	NW.	31	SE.	4,697
Nov	26.945	26.919	26.936	26.933	27.133	29	26.605	26	.528	27.3	47.6	33.3	36.1	67.1	7	—11.0	23	78.1	50.8	23.0	.37	.18	21, 22	...	....	....	SE.	3,863
Dec	26.889	26.867	26.865	26.874	27.247	24	26.419	27	.828	1.8	11.3	3.6	5.6	58.0	2	—47.5	24	105.5	15.2	—3.5	.27	.08	22, 23	...	....	....	N.	......
Sums	321.996	321.717	321.872	321.861	....	...	....	...	9.194	385.7	599.9	488.0	491.3	.....	..	......	....	789.1	658.5	345.8	16.60	....	......	...	....	....	....	......
Means	26.833	26.810	26.828	26.822	27.391	*1	26.030	†17	.766	32.1	50.0	40.7	40.9	100.0	‡14	—47.5	§24	65.8	54.9	28.8	.....	...	......	...	....	....	SE.	......

* January. † February. ‡ August. § December.

CUSTER, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.												Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.									
1884.										°	°	°	°																	
Jan……	27	3	11	21	0	4	15	6	6	3.0	13.4	9.8	8.7	77.5	78.4	78.2	78.0	5.1	7.5	5.2	5.9	5	16	10	14	19	30	0	0	0
Feb……	24	9	2	10	2	11	12	11	6	—2.3	6.3	1.0	1.7	79.2	78.6	76.0	77.9	6.5	8.0	5.5	6.7	3	13	13	12	21	29	0	0	0
Mar ….	10	15	15	30	1	5	13	4	0	14.6	25.3	21.0	20.3	82.4	77.5	83.1	81.0	4.8	6.6	4.7	5.4	11	8	12	8	7	29	0	0	0
Apr …..	18	11	18	12	0	3	9	17	2	27.9	32.1	31.3	30.4	81.2	48.1	65.3	64.9	5.3	6.0	4.5	5.3	8	13	9	8	0	17	0	0	0
May …..	8	6	17	18	7	9	17	8	3	39.3	40.7	43.6	41.2	86.6	44.3	66.0	65.9	4.7	5.9	4.3	5.0	8	15	8	8	0	4	0	1	0
June ….	11	10	22	11	8	8	12	11	2	51.6	56.1	54.7	54.1	86.9	49.7	66.6	67.7	4.4	4.3	4.3	4.3	11	13	6	10	0	0	3	10	0
July…..	9	24	26	5	0	1	13	11	4	49.3	52.4	51.6	51.1	80.2	41.9	56.4	59.5	4.3	4.5	4.9	4.6	11	14	6	9	0	0	2	6	0
Aug …..	9	13	21	16	0	4	8	16	6	47.9	50.9	50.0	49.6	78.8	37.9	55.5	57.4	4.7	5.0	3.4	4.4	11	16	4	5	0	0	10	2	0
Sept ….	16	9	7	12	5	5	12	12	12	39.1	41.5	41.7	40.8	81.0	48.5	65.8	65.1	6.4	6.4	5.2	6.0	5	13	12	12	0	1	0	0	0
Oct ……	7	4	10	19	2	12	16	12	11	32.6	37.5	35.6	35.2	80.2	47.8	66.4	64.8	4.4	5.6	3.2	4.4	11	14	6	6	0	10	0	0	0
Nov …..	4	11	4	26	3	7	11	16	8	21.4	28.7	24.1	24.7	78.8	51.2	70.2	66.7	3.6	5.2	3.7	4.2	14	10	6	4	4	26	0	0	0
Dec……	30	10	8	12	3	3	5	14	3	—2.4	1.6	—1.7	— .8	83.8	68.5	79.2	77.2	6.3	6.8	5.5	6.2	4	14	13	11	21	29	0	0	0
Sums ..	173	125	161	192	31	72	143	138	63	322.0	386.5	362.7	357.0	976.6	672.4	829.0	826.1	60.5	71.8	54.4	62.4	102	159	105	107	72	175	15	19	0
	Percentages.																					Percentages.								
Means .	15.8	11.4	14.7	17.5	2.8	6.6	13.0	12.6	5.7	26.8	32.2	30.2	29.7	81.4	56.0	69.1	68.8	5.0	6.0	4.5	5.2	27.9	43.4	28.7	29.2	19.7	47.8	4.1	5.2	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.58 a. m., 12.58 p. m., and 8.58 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.380; February, 3.360; March, 3.330; April, 3.180; May, 3.100; June, 3.060; July, 3.020; August, 3.060; September, 3.120; October, 3.240; November, 3.320; December, 3.400.

W. J. DAILEY,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DAVENPORT, IOWA.

Location of office on December 31, 1884, First National Bank, corner Second and Main streets.

[**Latitude, 41° 30′ N.; longitude, 90° 38′ W. Elevation of barometer** above sea-level, 615 feet. Elevation of exposed **thermometer above ground, 47 feet. Elevation of rain-**gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.509	29.499	29.525	29.511	30.001	5	28.918	30	1.083	12.9	22.9	19.5	18.8	47.2	30	−27.0	5	74.2	27.2	5.8	.75	.40	1, 2	28	SW.	16 21	NW.	6,694
Feb	29.370	29.340	29.355	29.355	29.761	10	28.776	19	.985	22.4	31.1	27.3	26.9	47.7	1	− 4.0	14 28 29	51.7	35.6	18.1	.98	.27	12	27	NW.	19 22	NW.	6,972
Mar	29.337	29.324	29.360	29.340	29.749	30	28.544	11	1.205	30.9	41.3	36.9	36.4	65.0	27	− 8.0	8	73.0	44.7	22.8	3.27	1.91	25	35	SE.	27	SE.	7,184
Apr	29.285	29.262	29.281	29.276	29.683	21	28.688	15	.995	43.4	56.7	50.1	50.1	78.7	30	24.0	8	54.7	59.4	36.4	.77	.16	29	44	W.	27	NW.	7,779
May	29.294	29.280	29.283	29.286	29.723	29	28.867	1	.856	55.4	67.9	60.3	61.2	79.7	21	38.0	1 2 29	41.7	69.9	48.2	3.79	1.12	5, 6	34	S.	5	W. NW.	6,190
June	29.365	29.333	29.343	29.347	29.575	14	29.044	9	.531	65.9	76.9	68.9	70.3	88.2	30	43.7	10	44.5	79.0	58.0	3.07	.98	1, 2	28	SW.	8	E.	4,579
July	29.278	29.263	29.256	29.266	29.509	20	29.017	4	.492	66.0	78.1	71.3	71.8	87.7	22	50.0	6	37.7	80.7	59.7	4.51	.97	25, 26	36	NW.	22	NW.	5,111
Aug	29.383	29.372	29.373	29.376	29.727	9	29.044	29	.683	63.7	77.8	69.0	70.0	88.4	19	44.5	8	43.9	78.7	58.0	3.84	1.85	27, 28	24	S.	2	NW.	5,472
Sept	29.352	29.318	29.331	29.334	29.718	20	28.875	28	.843	63.4	76.6	68.5	69.5	90.0	8	51.0	18	39.0	77.9	61.9	4.79	1.87	15	25	SW.	28	SW.	6,130
Oct	29.464	29.429	29.452	29.448	29.845	14	29.150	5	.695	52.0	63.5	56.0	57.2	83.2	3	28.6	23	54.6	65.5	49.6	7.17	4.12	7	25	SW.	5	SW.	6,033
Nov	29.422	29.418	29.438	29.424	29.817	6	28.800	22	1.017	35.7	45.8	39.4	40.3	63.2	9	5.0	24	58.2	49.0	31.7	1.49	1.16	22, 23	28	NW.	23	NW.	5,265
Dec	29.449	29.483	29.452	29.445	29.987	18	28.673	6	1.314	22.8	27.7	24.9	25.1	56.7	4	− 9.8	18	66.5	33.0	19.0	3.08	.99	30	35	W.	31	NW.	6,034
Sums	352.508	352.266	352.449	352.408	....	...	....	...	10.699	584.6	665.8	592.1	597.6	......	......	......	..	639.7	700.6	463.7	38.11	...	......	...	....	....	....	73,493
Means	29.376	29.356	29.371	29.368	30.001	*5	28.544	†11	.892	44.6	55.5	49.3	49.8	90.0	‡8	−27.0	*5	53.3	58.4	38.6	.....	...	......	...	....	....	NW.	.....

* January. † March. ‡ September.

DAVENPORT, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.									
										Washington time.																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																		Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan	11	9	2	4	2	23	13	29	0	5.6	7.8	8.3	7.2	69.2	53.1	61.3	61.2	5.2	4.7	3.8	4.6	10	15	6	8	19	29	0	0	0	Frozen.									
Feb	2	11	14	5	8	8	11	28	0	15.3	20.1	18.9	18.1	73.4	63.1	69.8	68.8	7.5	7.9	5.1	6.8	3	12	14	12	9	28	0	0	0										
Mar	8	17	9	19	3	9	11	15	2	22.2	26.6	25.8	24.9	69.8	57.0	64.4	63.7	6.4	6.8	6.9	6.7	5	11	15	11	9	18	0	1	0	*11	11	28 29	9	1	24	2	10	10	11.0
Apr	3	21	14	7	7	7	7	22	2	34.8	36.2	38.5	36.5	71.9	48.6	65.1	61.9	6.4	6.9	6.7	6.7	4	12	14	12	0	8	0	1	1	11	7	4	8	2	25, 27 28	3	5	9	8.8
May	5	14	12	9	6	11	17	17	2	46.6	47.1	49.9	47.9	72.9	50.4	69.6	64.3	5.4	5.7	5.0	5.4	9	11	11	14	0	0	0	5	0	8	10	4 19	6	10	31	2	0	8	3.7
June ...	2	14	25	17	9	18	3	0	2	58.9	61.6	61.4	60.6	81.1	60.6	77.4	73.0	5.7	6.7	3.7	5.4	8	12	10	14	0	0	0	6	0	7	8	3 6	5	11	30	1	9	6	8.9
July	5	7	14	12	5	14	14	21	1	59.4	61.6	63.4	61.5	79.5	58.2	76.3	71.3	5.4	5.7	3.8	5.0	8	17	6	11	0	0	0	9	0	5	10	1	2	10	28	3	0	4	2.7
Aug	2	9	8	10	11	17	14	20	2	57.6	58.5	60.9	59.0	80.9	53.8	76.0	70.2	3.8	5.9	3.3	4.3	11	16	4	11	0	0	0	3	0	3	7	9	2	5	17, 18	1	2	2	10.8
Sept	2	5	12	8	20	25	7	10	1	57.6	59.8	60.4	59.3	81.3	57.8	75.8	71.6	4.3	5.5	4.0	4.6	11	13	6	13	0	0	0	10	1	11	4	28	2	6	2	8	10	5	8.8
Oct	3	4	11	10	6	29	11	18	1	47.4	46.9	47.5	47.3	84.4	57.1	73.8	71.8	3.5	5.0	3.4	4.0	16	10	5	11	0	1	0	2	0	11	4	18 19	7	6	31	3	10	10	1.2
Nov	7	11	7	8	9	11	16	19	2	29.1	31.9	31.3	30.8	76.6	58.7	72.8	69.4	4.1	4.5	4.0	4.2	11	13	6	4	0	11	0	0	0	7	2	1	3	2	30	4	0	5	9.9
Dec	7	13	5	8	5	15	16	24	0	17.4	19.1	19.4	18.6	79.3	70.2	79.3	76.3	7.0	7.0	5.9	6.6	4	13	14	16	13	22	0	0	0	†4	10	15	1	11	3	2	11	3	5.1
Sums ..	57	135	133	117	91	187	140	223	15	451.9	477.2	485.7	471.7	920.3	688.6	861.6	823.5	64.7	72.3	55.6	64.3	100	155	111	137	50	117	0	37	2	......		..	......		......	......		......	
	Percentages.																					Percentages.																		
Means .	5.2	12.2	12.1	10.7	8.3	17.0	12.8	20.3	1.4	37.7	39.8	40.5	39.3	76.7	57.4	71.8	68.6	5.4	6.0	4.6	5.3	27.3	42.3	30.3	37.4	13.7	32.0	0	10.1	.5	......		..	......		......	......		......	

* 8 days. † 17 days. NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.06 a. m., 2.06 p. m., and 10.06 p. m., local time.

Correction for instrumental error of barometer used: From 6.06 a. m. January 1, to 10.06 p. m., December 31, 1884, inclusive, —.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.700; March, 0.690; April, 0.670; May, 0.640; June, 0.640; July, 0.630; August, 0.630; September, 0.650; October, 0.660; November, 0.690; December, 0.710.

REMARKS.—March 24, navigation opened, first, boat arrived; April 8, last snow of spring; May 29, last frost of spring; October 9, first frost of autumn; November 4, first snow of autumn; November 22, navigation closed last boat of season; December 18, river closed.

ROB'T R. MARTIN, *Sergeant, Signal Corps, U. S. A.*

Meteorological summary for the year ending December 31, 1884—Continued.

DAVIS, FORT, TEX.

Location of office on December 31, 1884, Post Quarters.

[Latitude 30° 38′ N.; longitude 103° 56′ W. Elevation of barometer above sea-level, 4,928 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 10 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	8 p. m.	11 p. m.							7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	25.317	25.236	25.253	25.269	25.536	20, 21	24.963	6	.573	27.9	50.6	39.4	39.3	73.1	29	6.0	1	67.1	52.5	26.5	.48	.40	10, 11	28	N.	10	N.	4,471
Feb	25.205	25.128	25.150	25.161	25.430	22	24.912	12	.518	39.6	64.5	50.8	51.6	76.2	26	20.0	14	56.2	65.6	38.3	.00	.00	......	24	NE.	22	SE.	3,888
Mar	25.120	25.059	25.080	25.086	25.378	14	24.755	6	.623	42.5	66.8	54.1	54.5	77.1	29	30.1	13	47.0	67.7	41.9	.28	.24	23	36	SW.	10–31	SW.	7,064
Apr	25.166	25.106	25.111	25.128	25.370	31	24.856	28	.514	44.8	67.4	54.7	55.5	80.1	25	27.0	21	53.1	68.5	42.8	1.63	1.22	2, 3	32	SW.	14 25 30	SW.	5,851
May	25.192	25.148	25.161	25.167	25.493	8	25.002	20	.491	53.0	76.4	62.8	64.1	87.9	29	40.0	4–8, 9	47.9	79.6	49.7	1.08	.75	25	28	NE.	2	SW.	4,662
June	25.233	25.194	25.205	25.211	25.338	28	25.059	6	.279	62.5	83.4	70.1	72.0	97.0	25	52.0	8	45.0	87.4	60.3	2.78	.75	19, 20	32	SE.	20	SW.	4,858
July	25.234	25.208	25.213	25.218	25.299	19	25.125	18	.174	68.9	91.7	77.7	79.4	101.0	11 12 30	60.5	20	40.5	95.2	67.4	.35	.16	15–18	20	NE.	4	SW.	4,211
Aug	25.266	25.237	25.248	25.250	25.365	30	25.139	2	.226	64.3	84.4	71.0	73.2	100.0	2	58.0	26, 29	42.0	88.0	62.4	6.70	3.30	25, 26	24	S.	18	SW.	3,794
Sept	25.240	25.208	25.222	25.223	25.383	20	25.054	29	.329	60.8	79.1	68.6	69.5	88.0	6, 7	49.0	28	39.0	82.4	59.1	3.74	1.2[illegible]	7, 8	20	NE.	23	SW.	3,362
Oct	25.281	25.242	25.259	25.261	25.453	16	25.070	1	.383	50.5	69.3	58.9	59.6	82.0	1, 7	36.0	28, 29, 30	46.0	71.8	49.5	4.35	1.62	23	20	NE. S. NE. SW.	8 19 22 26	NE.	4,512
Nov	25.304	25.256	25.272	25.277	25.482	6	24.963	21	.529	38.6	61.2	50.8	50.2	76.0	1, 2	27.0	20, 24 28, 30	49.0	63.0	37.4	.69	.50	10	32	SW., N.	22, 27	SW.	5,231
Dec	25.222	25.142	25.166	25.177	25.416	1	24.895	27	.521	35.0	56.9	45.9	45.9	74.0	23	18.0	11	56.0	58.8	33.2	.48	.21	10	36	SW.	20	SW.	6,085
Sums	302.780	302.164	302.340	302.428	......	......	......	...	5.160	587.4	851.7	704.8	714.6	....	......	......	......	588.8	880.5	568.5	22.56	....	......	...	....	....	......	57,489
Means	25.232	25.180	25.196	25.202	25.536	*20 *21	24.755	†6	.430	49.0	71.0	58.7	59.6	101.0	‡11 ‡12 ‡30	*6.0	*1	49.1	73.4	47.4	......	....	......	...	....	....	SW.	......

* January. † March. ‡ July.

DAVIS FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	21	4	0	16	20	18	1	0	13	21.0	23.5	25.3	23.3	75.8	39.9	60.2	58.6	3.3	4.3	3.0	3.5	14	13	4	5	3	20	0	0	0
Feb	5	10	1	31	14	13	6	2	5	30.5	29.4	30.7	30.2	69.9	30.2	48.0	49.4	3.9	5.1	3.2	4.1	11	13	5	0	0	4	0	0	0
Mar	5	4	0	6	6	63	2	1	6	35.6	32.7	32.0	33.4	77.2	30.5	45.7	51.1	4.5	5.1	2.5	4.0	14	12	5	3	0	1	0	0	0
Apr	11	13	5	3	2	44	5	3	4	39.3	28.6	35.2	34.4	82.8	28.2	53.3	54.8	3.0	3.4	2.6	3.0	19	7	4	4	0	3	0	3	0
May	6	13	3	15	1	36	3	0	16	42.9	40.2	42.9	42.0	69.2	31.7	51.8	50.9	2.0	5.6	2.4	3.3	17	10	4	5	0	0	0	5	0
June	7	13	13	4	5	37	2	0	9	54.5	51.6	54.9	53.7	75.4	36.3	61.2	57.6	1.0	6.6	3.6	3.7	14	15	1	13	0	0	7	13	0
July	8	6	17	7	13	25	2	0	15	60.7	52.3	55.9	56.3	75.4	27.5	48.2	50.4	1.1	4.8	3.1	3.0	16	14	1	5	0	0	29	4	0
Aug	13	9	11	6	4	26	1	1	22	54.5	54.6	54.6	54.6	72.7	39.2	58.9	56.9	1.9	6.0	3.1	3.7	13	14	4	9	0	0	9	6	0
Sept	8	10	6	9	10	13	3	1	25	54.0	56.1	56.8	55.6	80.8	48.0	67.9	65.6	3.8	6.7	4.6	5.0	10	12	8	10	0	0	0	1	0
Oct	14	18	10	7	13	15	0	0	16	47.4	51.8	51.1	50.1	89.3	57.1	78.0	74.8	5.7	6.3	4.0	5.3	8	13	10	6	0	0	0	1	0
Nov	19	5	1	0	11	32	3	0	19	35.7	39.8	40.7	38.7	89.8	49.1	70.1	69.7	3.3	3.9	2.4	3.2	16	9	5	4	0	5	0	1	0
Dec	14	8	0	4	6	47	2	0	12	31.6	29.3	31.0	30.6	87.8	39.7	60.2	62.6	3.6	4.6	4.3	4.2	15	7	9	4	0	11	0	1	0
Sums ..	131	113	67	108	105	374	30	8	162	507.7	489.9	511.1	502.9	946.1	457.4	703.5	702.4	37.1	62.4	38.8	46.0	167	139	60	68	3	44	45	35	0
	Percentages.																					Percentages.								
Means.	12.0	10.3	6.1	9.8	9.6	34.1	2.7	.7	14.8	42.3	40.8	42.6	41.9	78.8	38.1	58.6	58.5	3.1	5.2	3.2	3.8	45.6	38.0	16.4	18.6	0.8	12.0	12.3	10.0	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.12 a. m., 1.12 p. m., and 9.12 p. m., local time.

Correction for instrumental error of barometer used: From 5.12 a. m., January 1 to 5.12 a. m., December 30, inclusive, +.035 inch; from 1.12 p. m., December 30, to 9.12 p. m., December 31, 1884, inclusive, +001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.970; February, 4.950; March, 4.870; April, 4.780; May, 4.710; June, 4.600; July, 4.630; August, 4.640; September, 4.690; October, 4.840; November, 4.890; December, 4.930.

REMARKS.—Late killing frosts, April 21, 22; first killing frost, October 28. Office moved March 3, from outside the post to Government building north side of post, inside reservation. Former elevation of barometer 4,940 feet; thermometer 4.6 feet; rain-gauge 20.0 feet; present elevation of barometer 4,928 feet; thermometer 5.6 feet; rain-gauge 10.3 feet.

L. H. ALBRECHT,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—**Continued.**

Location of office on December 31, 1884, Fourth street, head of Spring street.

DAYTON, WASH.

[Latitude, 46° 19′ N.; longitude, 117° 56′ W. Elevation of barometer above sea-level, 1,673 (B.) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	8 p. m.	11 p. m.							7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.436	28.444	28.421	28.434	28.948	1	27.807	27	1.141	28.1	34.4	29.0	30.5	57.1	11	— 1.5	1	58.6	37.0	23.1	3.14	1.52	3, 4	24	SW.	7, 8, 12	SW.	3,001
Feb	28.293	28.306	28.285	28.295	28.810	26	27.504	17	1.306	20.4	30.9	23.1	24.8	58.0	24	—21.5	12	79.5	33.7	14.9	5.66	1.00	17	28	SW.	18, 20, 21	SW.	3,974
Mar	28.175	28.181	28.158	28.171	28.485	20	27.539	9	.946	33.5	47.2	38.9	39.9	63.9	18	21.2	6, 7	42.7	50.0	31.7	1.79	1.00	9, 10	24	SW.	10, 11	SW	4,591
Apr	28.188	28.190	28.164	28.181	28.510	19	27.813	10	.697	41.9	60.4	49.9	50.7	77.9	8	32.5	27	45.4	64.6	49.8	2.40	.66	23, 24	24	NE.	26	SW.	4,622
May	28.246	28.242	28.207	28.232	28.491	29	27.913	20	.578	48.6	71.0	59.5	59.7	87.3	31	35.5	12	51.8	75.1	45.3	.81	.37	3	20	SW. N.	3, 25	SW.	4,535
June	28.200	28.184	28.166	28.183	28.443	17	27.978	11	.465	54.3	73.8	64.0	64.0	97.5	18	38.0	27	59.5	78.8	52.1	2.02	.75	22	20	SW.	22	SW.	3,777
July ...	28.260	28.260	28.222	28.247	28.491	8	28.017	5	.474	54.6	75.0	64.8	64.8	95.5	25	44.0	13	51.5	80.4	51.6	.32	.10	22	18	SW.	2, 6, 16, 31	SW.	4,334
Aug	28.251	28.251	28.224	28.242	28.449	28	28.030	26	.419	57.6	84.6	69.1	70.4	101.8	5	41.8	16	60.0	89.8	54.5	.09	.06	6	16	SW.	30, 31	SW.	4,320
Sept	28.242	28.242	28.210	28.231	28.491	26	27.933	7	.558	46.3	64.4	52.5	54.4	82.5	20	31.3	26	51.2	67.8	42.9	1.40	.45	3, 4	20	SW.	27	SW.	4,176
Oct	28.298	28.319	28.305	28.307	28.655	16	27.827	12	.828	44.4	59.2	48.9	50.8	73.7	12	28.8	7	44.9	62.8	40.4	3.45	1.47	11, 12	22	SW.	13	SW	4,244
Nov	28.423	22.433	28.417	28.424	28.686	29	28.156	21	.530	35.4	46.0	38.7	40.0	64.0	25	23.5	22	40.5	48.0	32.2	.25	.10	8	24	SW.	26	SW.	2,213
Dec	28.277	28.287	28.292	28.285	28.815	9	27.667	19	1.148	13.7	19.9	13.9	15.8	48.2	3	—26.0	31	74.2	23.7	7.2	5.10	.74	17, 18	24	SW.	20	SW.	2,385
Sums ..	339.289	339.339	339.071	339.232	......	..	....	...	9.090	478.8	666.8	552.3	565.8	......	..	....	...	659.8	711.8	435.7	26.43	....	......	...	....	......	....	46,172
Means .	28.274	28.278	28.256	28.269	28.948	*1	27.504	†17	.758	39.9	55.6	46.0	47.2	101.8	‡5	—26.0	§31	55.0	59.3	36.3	.....	....	......	...	....	......	....	......

* January. † February. ‡ August. § December.

DAYTON, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	13	5	5	3	1	29	21	8	8	23.6	26.5	25.3	25.1	85.0	75.3	87.9	82.7	4.4	4.6	4.9	4.6	8	15	8	12	9	26	0	0	0
Feb	3	11	4	5	3	38	13	7	3	15.9	19.0	19.2	18.0	83.6	64.0	85.3	77.6	5.5	6.4	5.3	5.7	10	6	13	16	14	24	0	0	1
Mar	11	13	7	9	12	27	9	3	2	29.0	33.7	32.7	31.8	82.6	62.3	78.8	74.6	5.5	6.6	4.5	5.5	6	15	10	10	1	16	0	0	1
Apr	8	13	19	5	5	26	13	0	1	35.0	38.5	38.5	37.3	77.8	47.8	67.0	64.2	3.9	4.2	3.3	3.8	15	10	5	14	0	0	0	2	0
May	2	20	3	17	3	40	0	6	2	38.6	44.8	43.9	42.4	69.5	40.5	57.4	55.8	2.7	3.7	3.3	3.2	15	13	3	4	0	0	0	2	0
June	7	5	7	12	10	36	9	2	2	46.9	49.8	50.9	49.2	77.1	44.8	64.1	62.0	5.8	5.5	5.4	5.6	6	16	8	16	0	0	3	5	0
July	4	2	6	10	15	41	8	0	7	45.2	47.5	46.6	46.4	71.7	39.6	53.1	54.8	4.0	4.4	3.8	4.1	13	12	6	6	0	0	3	2	1
Aug	6	5	11	13	7	39	8	4	0	43.2	43.6	42.3	43.0	59.8	26.4	39.1	41.8	1.6	1.5	1.3	1.5	25	5	1	2	0	0	16	1	0
Sept	5	5	3	13	4	47	5	2	6	39.5	41.0	40.0	40.2	78.4	44.0	64.8	62.4	4.4	5.8	4.4	4.9	9	14	7	10	0	1	0	0	1
Oct	6	7	5	12	6	45	7	1	3	37.8	42.0	39.4	39.7	78.4	54.6	71.6	68.2	3.7	4.7	4.6	4.3	12	11	8	14	0	3	0	0	0
Nov	12	15	3	2	4	28	10	3	13	33.7	37.8	36.3	35.8	93.7	75.0	92.5	87.1	2.6	5.4	2.6	3.5	14	10	6	6	0	11	0	0	0
Dec	7	12	1	3	3	36	9	0	22	11.0	12.5	9.1	10.9	89.1	74.3	84.0	82.5	7.5	7.8	6.5	7.3	5	9	17	20	20	29	0	0	0
Sums	84	113	75	104	73	432	112	36	69	399.4	436.2	424.2	419.8	946.7	648.6	845.6	813.7	51.6	60.6	49.9	54.0	138	136	92	130	44	110	22	12	4
	Percentages.																					Percentages.								
Means	7.7	10.3	6.8	9.5	6.6	39.3	10.2	3.3	6.3	33.3	36.4	35.4	35.0	78.9	54.0	70.5	67.8	4.3	5.0	4.2	4.5	37.7	37.2	25.1	35.5	12.0	30.1	6.0	3.3	1.1

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.16 a. m., 12.16 p. m., and 8.16 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.013 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.81; February, 1.82; March, 1.82; April, 1.76; May, 1.76; June, 1.75; July, 1.72; August, 1.72; September, 1.75; October, 1.79; November, 1.79; December, 1.84.

H. S. BLANDFORD,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DEADWOOD, DAK.

Location of office on December 31, 1884, Big Horn Building.

[Latitude, 44° 23′ N.; longitude, 103° 43′ W. Elevation of barometer above sea-level, 4,600 (B) feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 52 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	25.339	25.318	25.345	25.334	25.712	1	24.991	9	.721	18.2	25.7	19.9	21.3	59.1	12	—14.5	4	73.6	31.0	11.5	.85	.19	18, 19	21	NE.	29	SW.	3,155
Feb	25.226	25.214	25.252	25.231	25.614	26	24.519	18	1.095	11.5	20.6	13.3	15.1	50.0	24	—26.8	12	76.8	24.9	4.8	1.01	.22	26, 27	32	SW.	18	SW.	3,083
Mar	25.232	25.215	25.241	25.229	25.564	13	24.541	10	1.023	22.8	33.2	26.4	27.5	52.0	26	— 7.2	6	59.2	35.6	19.6	2.61	1.16	27, 28	24	SW.	9	E.	3,316
Apr	25.320	25.308	25.322	25.317	25.727	19	24.862	29	.865	30.7	41.5	36.1	36.1	62.0	24	13.0	6	49.0	43.9	29.6	2.29	.43	7, 8	19	SW.	29	SE.	3,932
May	25.397	25.382	25.405	25.395	25.646	7	25.024	3	.622	42.9	56.5	48.0	49.1	71.5	10	28.0	1	43.5	59.5	40.7	1.72	.39	27, 28	21	SE.	27	NE.	3,852
June	25.404	25.394	25.401	25.400	25.618	18	25.045	12	.573	56.6	71.2	62.4	63.4	91.0	26	43.0	1	48.0	73.7	54.8	2.51	.65	11, 12	20	S.	10	NE., S.	4,124
July	25.426	25.404	25.420	25.417	25.610	8	25.192	31	.418	55.3	70.3	61.1	62.2	86.0	7	45.0	5	41.0	73.1	53.3	3.51	.70	26, 27	21	SE.	2	NE.	3,642
Aug	25.469	25.451	25.466	25.462	25.680	8	25.216	1	.464	54.2	70.1	60.0	61.4	83.0	14	40.5	20 21	42.5	71.7	52.6	3.07	1.29	19, 20	15	NE.	5	NE.	2,163
Sept	25.341	25.321	25.341	25.334	25.663	19	25.027	2	.636	46.7	60.9	50.9	52.8	78.5	13	28.0	30	50.5	63.1	44.7	1.99	.53	15	22	S.	8	SW.	2,532
Oct	25.402	25.371	25.413	25.395	25.762	16	24.962	1	.800	44.0	57.2	47.4	49.5	76.0	14	26.0	23 27	50.0	60.1	39.5	1.48	.68	2, 3	23	NE.	6	SW.	3,024
Nov	25.432	25.416	25.441	25.430	25.662	12	25.108	26	.554	31.3	43.2	33.8	36.1	62.0	6	— 4.0	23	66.0	46.6	27.8	1.46	.69	26, 27	15	E.	28	NE.	2,079
Dec	25.251	25.243	25.269	25.254	25.591	10	24.786	19	.805	7.5	16.3	11.1	11.6	53.0	1	—28.0	24	81.0	21.0	3.3	1.79	.29	6	16	NE.	26	NE.	1,495
Sums	304.239	304.037	304.316	304.198	......	...	......	...	8.576	421.7	566.7	470.4	486.1	....	.	......	...	681.1	604.2	382.2	24.29	....	......	..	......	....	......	36,847
Means	25.353	25.336	25.360	25.350	25.762	*16	24.519	†18	.715	35.1	47.2	39.2	40.5	91.0	‡26	—28.0	§24	56.8	50.4	31.8	.....	....	......	..	......	....	SW.	......

* October. † February. ‡ June. § December.

DEADWOOD, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	11	8	3	3	17	35	6	6	4	12.9	16.3	14.0	14.4	83.1	68.1	75.2	75.5	4.1	4.1	4.1	4.1	11	14	6	15	15	30	0	0	0
Feb	6	21	0	1	4	28	8	2	17	6.3	12.4	8.3	9.0	80.3	71.1	80.7	77.4	3.9	5.0	4.4	4.4	9	14	6	17	16	26	0	0	0
Mar	2	20	26	8	4	9	14	5	5	18.1	23.9	20.8	20.9	81.8	69.5	79.8	77.0	5.1	5.8	5.6	5.5	10	10	11	16	8	26	0	0	0
Apr	10	14	10	20	17	10	4	4	1	25.8	30.8	29.0	28.5	82.5	67.3	76.9	75.6	5.2	6.5	4.5	5.4	6	14	10	16	1	18	0	0	0
May	8	25	6	13	10	17	9	5	0	36.5	39.3	38.9	38.2	78.5	54.9	71.8	68.4	3.7	4.9	2.7	3.8	17	8	6	11	0	2	0	0	0
June	10	21	2	12	21	18	3	3	0	49.5	51.1	52.4	51.0	78.3	51.9	70.8	67.0	2.7	4.7	2.7	3.4	15	13	2	15	0	0	1	5	0
July	11	26	12	7	14	15	5	0	3	48.9	52.5	51.4	50.9	79.5	55.0	71.1	68.5	3.9	5.8	2.5	3.9	12	16	3	14	0	0	0	6	0
Aug	1	26	9	6	14	18	8	2	9	46.5	48.5	49.1	48.0	76.1	49.0	68.7	64.6	2.3	5.0	2.8	3.4	16	11	4	7	0	0	0	1	0
Sept	5	18	4	2	13	21	11	2	14	37.8	38.6	39.5	38.6	72.5	47.3	66.7	62.2	3.7	4.4	2.5	3.5	15	10	5	8	0	1	0	1	1
Oct	2	17	5	4	8	37	6	0	14	31.1	32.7	31.6	31.8	62.5	42.0	57.4	54.0	2.5	3.4	2.9	2.9	16	13	2	9	0	8	0	1	0
Nov	0	27	11	5	8	26	3	2	8	21.0	23.6	21.4	22.0	66.0	48.0	60.8	58.3	2.0	4.2	2.7	3.0	17	9	4	8	3	15	0	0	0
Dec	3	27	10	4	2	26	7	1	13	2.0	5.9	4.4	4.1	78.9	64.4	75.2	72.8	4.8	6.0	4.4	5.1	10	13	8	17	20	27	0	0	0
Sums	69	250	98	85	132	260	84	32	88	336.4	375.6	360.8	357.4	920.0	688.5	855.1	821.3	43.9	59.8	41.8	48.4	154	145	67	153	63	153	1	14	1
	Percentages.																					Percentages.								
Means	6.3	22.8	8.9	7.7	12.0	23.7	7.7	2.9	8.0	28.0	31.3	30.1	29.8	76.7	57.4	71.3	78.5	3.7	4.9	3.5	4.0	42.1	39.6	18.3	41.8	17.2	41.8	.3	3.8	.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.13 a. m., 1.13 p. m., and 9.13 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, +.015.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.95; February, 4.92; March, 4.84; April, 4.69; May, 4.53; June, 4.44; July, 4.43; August, 4.44; September, 4.56; October, 4.68; November, 4.84; December, 4.90.

GEORGE KINGSBURY,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DELAWARE BREAKWATER, DEL.

Location of office on December 31, 1884, northwest end Delaware Breakwater.

[Latitude, 38° 48′ N.; longitude, 75° 10′ W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 26 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.157	30.109	30.126	30.131	30.859	27	29.230	9	1.629	28.9	33.4	31.1	31.1	53.0	2	9.0	7	44.0	37.5	25.1	4.19	1.02	8, 9	52	SW.	13	NW.	14,214
Feb	30.068	30.045	30.099	30.071	30.727	16	29.163	28	1.564	39.4	42.2	38.2	39.9	63.5	5	15.0	29	48.5	46.9	33.0	6.14	1.72	23	68	NW.	20	NE., SE.	11,847
Mar	30.036	29.979	30.031	30.015	30.471	16	29.483	26	.988	37.8	42.8	39.6	40.1	62.4	12	15.3	1	47.1	47.0	34.6	6.71	1.79	19	56	NW.	30	NW.	12,976
Apr	29.882	29.829	29.873	29.861	30.217	12	29.134	2	1.083	44.9	50.5	46.2	47.2	70.0	16	35.0	6	35.0	53.0	42.1	1.82	.72	25, 26	52	SW.	9	NW.	11,484
May	29.962	29.928	29.956	29.949	30.331	3	29.612	11	.719	58.2	63.7	58.0	60.0	81.3	2	45.5	30	35.8	66.6	53.7	.88	.48	7	40	NE.	20	SW.	10,806
June	30.067	30.042	30.046	30.052	30.452	15	29.697	26	.755	65.3	70.6	65.5	67.1	84.1	21	52.3	1	31.8	73.5	61.5	1.37	.52	11, 12	56	NE.	14 26 27	NE.	11,541
July	29.862	29.834	29.861	29.859	30.042	22	29.618	29	.424	69.4	76.7	70.6	72.2	88.3	24	60.5	17	27.8	78.8	66.9	2.12	1.00	29	46	W.	24	SW.	10,542
Aug	30.046	30.020	30.036	30.034	30.290	25	29.693	30	.597	70.7	76.2	70.8	72.6	91.9	20	65.6	13	26.3	78.4	69.1	4.19	2.48	4, 5	53	SW.	22	NE.	9,192
Sept	30.124	30.074	30.102	30.100	30.431	14	29.737	17	.694	67.3	75.5	69.0	70.6	88.4	9	55.2	23	33.2	78.4	64.9	.99	.80	12	58	NE.	14	SW.	10,697
Oct	30.161	30.102	30.137	30.133	30.604	26	29.744	8	.860	57.9	65.9	59.4	61.1	83.3	6	34.5	16	48.8	67.9	54.7	1.12	.66	22, 23	51	NE.	15	SW.	10,697
Nov	30.104	30.054	30.073	30.077	30.446	22	29.384	28	1.062	44.4	52.6	46.9	48.0	69.4	2	28.0	25	41.4	54.8	41.5	2.42	.96	28, 29	54	SE.	23	SW., NW.	11,763
Dec	30.177	30.125	30.153	30.152	30.618 •	20	29.585	6	1.033	37.5	41.9	39.0	39.5	60.8	15	8.9	20	51.9	45.4	34.0	3.22	.84	6	51	SW., NW.	6 9	SW.	13,721
Sums ..	360.666	360.141	360.493	360.434	......	...	......	..	11.408	621.7	692.0	634.8	649.4	..	....	......	...	471.6	728.2	581.1	35.17	....	......	...	......	...	......	......
Means	30.056	30.012	30.041	30.036	30.859	*27	29.124	†2	.951	51.8	57.7	52.9	54.1	91.9	‡20		8.9	§20	39.3	60.7	48.4	....	....	......	...	......	...	SW.	139,480

* January. † April. ‡ August. § December.

DELAWARE BREAKWATER, DEL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	13	5	3	11	20	5	27	0	24.3	27.3	25.9	25.8	83.1	79.6	81.1	81.3	5.4	7.0	4.4	5.6	9	12	10	17	8	25	0	0	0
Feb	6	16	8	16	8	14	4	15	0	36.7	35.9	34.4	35.7	90.0	80.1	86.6	85.6	7.1	6.1	5.2	6.1	4	14	11	20	1	11	0	1	0
Mar	15	16	9	7	14	7	4	21	0	34.1	35.9	35.7	35.2	87.5	78.5	86.3	84.1	6.2	6.1	4.3	5.5	6	16	9	18	3	9	0	2	0
Apr	9	20	6	8	5	10	3	29	0	39.4	39.7	40.7	39.9	82.0	69.3	81.6	77.6	5.0	6.1	5.2	5.4	6	16	8	12	0	0	0	2	0
May	8	10	4	12	20	23	1	15	0	52.1	50.4	50.8	51.1	80.9	65.2	78.5	74.9	4.2	3.9	3.1	3.7	15	12	4	8	0	0	0	1	0
June	3	23	2	15	19	20	4	4	0	61.9	60.8	61.4	61.4	89.1	73.0	87.3	83.1	4.8	3.4	3.2	3.8	12	14	4	9	0	0	0	1	0
July	14	9	2	9	17	24	10	8	0	64.8	63.5	65.1	64.3	84.5	66.1	83.8	78.1	4.8	4.9	3.7	4.5	10	16	5	11	0	0	0	5	0
Aug	10	22	4	19	18	17	0	3	0	67.4	66.0	66.7	66.7	89.5	72.2	87.0	82.9	5.6	4.8	4.2	4.9	9	14	8	7	0	0	1	2	0
Sept	2	13	3	8	17	37	4	6	0	62.8	62.2	62.4	62.5	86.0	64.7	78.5	76.4	1.9	2.7	1.5	2.0	21	8	1	2	0	0	0	1	0
Oct	10	16	3	6	12	26	4	16	0	51.4	50.6	51.3	51.1	81.1	60.3	76.2	72.5	3.2	3.3	3.5	3.3	15	14	2	7	0	0	0	0	0
Nov	6	18	8	4	4	24	7	24	0	39.0	40.8	39.9	39.9	82.3	66.4	78.1	75.6	3.6	4.2	3.8	3.9	15	8	7	8	0	3	0	0	0
Dec	19	12	2	4	7	29	3	17	0	33.6	35.7	34.0	34.4	86.4	79.9	83.1	83.1	6.0	6.6	5.9	6.2	4	16	11	12	3	9	0	0	0
Sums	111	188	51	111	152	251	49	185	0	567.0	568.8	568.8	568.0	1,022.4	855.3	988.1	955.2	57.8	59.1	48.0	54.9	126	160	80	131	15	57	1	15	0
	Percentages.																					Percentages.								
Means	10.1	17.1	4.6	10.1	13.8	22.9	4.5	16.8	0	47.2	47.4	47.4	47.3	85.2	71.2	82.3	79.6	4.8	4.9	4.0	4.6	34.4	43.7	21.9	35.8	4.1	15.6	0.3	4.1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

REMARKS.—August 28, phosphorescence on bay; December 30, mirage.

CHAS. G. SHEARER.
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DENVER, COLO.

Location of office on December 31, 1884, Tabor Block, Sixteenth and Larimer streets.

[Latitude, 39° 45′ N.; longitude, 105° W. Elevation of barometer above sea-level, 5,294 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 86 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	24.730	24.695	24.759	24.728	25.058	20	24.350	9	.708	24.7	38.5	31.2	31.5	59.0	12	− 2.0	1	61.0	43.4	20.0	.22	.13	14	34	W. NW.	7 8 30	S.	5,650
Feb	24.599	24.576	24.614	24.596	24.933	23	23.939	18	.991	24.2	36.2	29.2	29.9	61.3	24	−15.0	12	76.3	40.8	19.4	.86	.60	26	36	W. NW. W.	21 23 24	S.	4,782
Mar	24.568	24.534	24.583	24.562	24.938	13	23.975	10	.963	32.7	45.2	39.0	39.0	61.1	4	−10.9	7	50.2	49.5	28.9	.93	.37	16, 17	54	W.	27	NW.	5,732
Apr	24.651	24.633	24.676	24.653	25.030	19	24.265	13	.765	35.4	51.2	43.9	43.5	70.3	24	22.5	19	47.8	53.5	32.4	3.33	1.71	18, 19	36	N.	1	S.	4,839
May	24.743	24.720	24.751	24.738	25.037	8	24.405	4	.632	46.1	61.7	55.1	54.3	80.5	9	28.0	1	52.5	65.5	43.0	4.61	1.60	15, 16	34	SW.	20	S.	4,964
June	24.705	24.770	24.803	24.789	24.984	18	24.504	11	.480	57.9	76.8	66.3	67.0	90.2	26	48.0	2	42.2	78.6	54.3	1.47	.61	14	30	W. & S.	22 26	S.	5,287
July	24.812	24.761	24.788	24.787	24.989	9	24.652	22	.337	62.9	85.9	73.9	74.2	96.5	6	52.0	31	44.5	87.6	59.3	.65	.12	21, 29, 30	33	N.	29	S.	5,073
Aug	24.859	24.829	24.855	24.848	25.046	3	24.550	19	.496	58.6	77.2	68.3	68.0	92.2	1	51.0	3 20 22	41.2	79.8	56.0	1.71	.88	9	28	W.	1	S.	4,475
Sept.....	24.744	24.692	24.718	24.718	25.066	19	24.364	7	.702	53.6	75.4	64.8	64.6	87.8	1	40.0	24	47.8	77.8	51.1	.18	.08	26, 27	48	S.	7	S.	4,544
Oct	24.821	24.751	24.810	24.794	25.170	16	24.339	1	.831	45.4	66.1	55.1	55.5	80.3	6	26.0	27	54.3	68.7	41.9	.21	.16	7	32	S. SW. WW.	2, 4 19 31	S.	4,140
Nov	24.827	24.783	24.835	24.815	25.054	5	24.422	21	.632	32.6	53.3	40.3	42.1	69.8	6	18.2	22	56.6	55.9	29.5	.19	.18	22	46	NW.	28	S.	4,820
Dec.* ...	24.601	24.563	24.615	24.593	24.967	10	24.057	21	.910	19.9	32.5	21.3	24.6	68.2	1	− 8.0	16	76.2	36.6	12.7	.76	.34	21	35	SW. NW.	19 20	S.	5,089
Sums ..	296.750	296.307	296.807	296.621	.....		....	...	8.450	494.0	700.0	588.4	591.2		...		.	650.6	737.7	448.5	15.07	....	....	...	....	....	....	59,395
Means .	24.729	24.692	24.734	24.718	25.170	†16	23.939	‡18	.704	41.2	58.3	49.0	49.5	96.5	§6	−15.0	‡12	54.2	61.5	37.4	....	....	....	...	....	....	S.	......

*One 7 a. m. observation missed.

† October.

‡ February.

§ July.

DENVER, COLO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	6	3	10	32	6	11	6	10	12.7	15.1	18.1	15.3	62.3	40.7	60.3	54.4	1.7	3.8	2.9	2.8	18	11	2	5	4	23	0	0	0
Feb	9	11	4	6	16	9	10	11	11	12.8	15.3	14.7	14.3	64.8	48.2	58.6	57.2	1.2	4.3	2.8	2.8	16	11	2	8	7	21	0	0	0
Mar	16	9	1	7	10	5	10	17	18	23.1	18.5	24.7	22.1	68.3	39.3	59.3	55.6	4.0	4.5	3.5	4.0	13	15	3	7	2	24	0	1	0
Apr	14	7	3	6	23	4	7	9	17	26.8	25.6	28.9	27.1	70.2	40.1	59.5	56.6	3.8	6.8	4.4	5.0	6	19	5	13	0	12	0	2	0
May	14	8	7	5	26	7	6	18	2	36.4	35.1	40.2	37.2	71.2	41.5	59.9	57.5	4.3	6.4	4.8	5.2	9	13	9	17	0	2	0	8	0
June	16	7	4	16	32	8	3	4	0	47.2	44.8	49.5	47.2	68.5	34.8	56.8	58.4	4.2	5.7	5.4	5.1	5	21	4	9	0	0	1	6	0
July	9	6	4	12	39	5	3	15	0	48.9	41.9	50.3	47.0	61.3	23.2	45.6	43.4	3.2	5.3	4.4	4.3	8	21	2	12	0	0	8	4	0
Aug	9	8	4	6	32	12	7	15	0	47.6	45.1	49.2	47.3	68.2	36.4	53.6	52.7	3.5	5.4	4.3	4.4	9	19	3	13	0	0	1	4	0
Sept	11	7	11	5	33	8	4	9	2	37.9	35.5	39.7	37.7	56.6	25.5	41.5	41.2	2.4	3.0	2.0	2.5	18	12	0	3	0	0	0	2	0
Oct	18	6	2	8	41	3	5	7	3	33.5	33.5	35.2	34.1	64.9	32.2	49.6	48.9	3.2	4.3	3.7	3.7	12	15	4	4	0	1	0	0	0
Nov	21	5	4	7	35	3	7	8	0	20.0	21.5	21.4	21.0	60.1	31.6	48.1	46.6	1.0	3.6	2.3	2.3	20	9	1	2	0	22	0	0	0
Dec	26	7	5	3	27	8	5	11	0	9.6	14.6	11.5	11.9	65.7	54.1	68.6	62.8	3.2	6.0	3.4	4.2	7	19	4	13	14	27	0	0	0
Sums	172	87	52	91	346	78	78	130	63	356.5	346.5	383.4	362.2	782.1	447.6	661.4	630.3	35.7	59.1	43.9	46.3	141	185	39	106	27	132	10	27	0
	Percentages.																					Percentages.								
Means	15.7	7.9	4.8	8.3	31.5	7.1	7.1	11.9	5.7	29.7	28.9	32.0	30.2	65.2	37.3	55.1	52.5	3.0	4.9	3.7	3.9	38.6	50.7	10.7	29.0	7.4	36.1	2.7	7.4	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time.

Correction for instrumental error of barometer used: From 5.08 a. m., January 1, to 9.08 p. m., December 31, 1884, inclusive, +.036 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.520; February, 5.520; March, 5.440; April, 5.270; May, 5.100; June, 5.040; July, 5.010; August, 5.020; September 5.110; October, 5.260; November, 5.500; December, 5.520.

J. GILLIGAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DES MOINES, IOWA.

Location of office on December 31, 1884, 525 Walnut street.

[Latitude, 41° 35′ N.; longitude, 93° 37′ W. Elevation of barometer above sea-level, 849 feet. Elevation of exposed thermometer above ground, 85 feet. Elevation of rain-gauge above ground, 45 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.294	29.266	29.277	29.279	29.816	4	28.662	9	1.154	10.9	19.8	17.3	16.0	48.7	17	—30.4	5	79.1	25.7	5.3	.85	.34	18	22	N.	10	N.	5,507
Feb	29.155	29.124	29.133	29.137	29.577	9	28.474	18	1.103	16.0	26.1	22.3	21.5	53.9	1	—8.2	28	62.1	30.8	10.8	1.92	.47	16, 17	26	N.	19 21	N.	5,513
Mar	29.081	29.061	29.094	29.085	29.510	14	28.326	10	1.184	29.5	40.0	34.3	34.6	70.1	27	—5.6	3	75.7	43.0	25.7	2.24	.71	21	26	N. NW.	2 11	N.	5,306
Apr	29.043	29.025	29.043	29.037	29.458	21	28.458	26	1.000	42.3	55.8	47.9	48.7	73.9	30	25.8	8	48.1	58.2	39.6	2.97	.61	1	25	NW.	27	N.	5,983
May	29.084	29.050	29.051	29.062	29.461	29	28.696	5	.765	52.7	68.1	58.6	59.8	80.1	17	34.6	2	45.5	71.5	50.2	4.34	1.57	6, 7	18	NE. N. SW.	13 18 22	N.	4,401
June	29.130	29.103	29.095	29.109	29.343	14	28.804	8	.530	63.3	78.1	68.6	70.0	94.7	30	47.2	10	47.5	81.2	61.3	3.84	1.60	13	22	NE.	30	SE.	2,955
July	29.065	29.038	29.085	29.046	29.327	20	28.773	4	.554	64.9	80.3	70.1	71.8	95.2	8	55.1	20	40.1	83.9	63.5	7.16	2.23	23, 24	28	NW.	23	N. SE.	3,448
Aug	29.159	29.138	29.120	29.130	29.492	9	28.845	28	.647	61.8	76.5	67.7	68.7	90.8	19	49.4	9	41.4	79.5	60.8	3.84	1.63	16, 17	20	W. N. NW.	25 29	S.	3,578
Sept	29.094	29.052	29.065	29.070	29.504	20	28.578	23	.926	61.0	76.0	66.8	67.9	91.8	8	42.8	25	49.0	78.4	59.2	5.46	1.95	23	28	SW.	15	S. SW.	4,168
Oct	29.206	29.178	29.190	29.191	29.590	23	28.856	5	.734	49.4	63.4	54.1	55.6	85.8	3	27.6	23	58.2	65.3	46.3	5.33	3.67	7	20	NE.	17	SW.	4,481
Nov	29.189	29.184	29.190	29.188	29.580	5	28.736	26	.844	32.2	44.2	36.4	37.6	63.6	15	1.9	23	61.7	47.4	28.0	1.26	1.12	22	24	N.	23	N.	3,458
Dec	29.222	29.207	29.220	29.216	29.773	24	28.010	6	1.103	15.8	21.8	17.7	18.4	50.4	3	—18.2	19	68.6	25.1	11.8	1.93	.60	30	18	N.	31	N.	4,241
Sums	349.742	349.446	349.518	349.559		..	......	...	10.613	499.8	650.1	561.8	570.6	..	...	......	...	677.0	690.0	462.5	41.14	....	......	...	....	....	....	52,989
Means	29.144	29.120	29.126	29.130	29.816	*4	28.326	†10	.884	41.6	54.1	46.8	47.5	95.2	‡8	—30.4	*5	56.4	57.5	38.5	.....	...	......	...	....	....	N.	......

* January. † March. ‡ July.

DES MOINES, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	35	3	4	2	11	12	13	12	1	*2.6	7.2	*9.3	6.4	*65.2	57.5	*67.1	63.3	3.6	6.5	5.1	5.1	9	14	8	9	16	29	0	0	0
Feb	32	8	6	7	10	5	8	10	1	7.2	14.1	13.3	11.5	67.3	60.5	67.8	65.2	7.0	7.2	5.4	6.5	3	13	13	14	16	29	0	0	0
Mar	20	18	8	13	9	12	4	9	0	21.2	26.8	25.1	24.4	70.9	61.2	69.2	67.1	7.3	7.3	6.5	7.0	4	11	16	16	7	15	0	2	0
Apr	23	10	6	16	9	4	5	12	5	33.4	34.7	36.8	35.0	70.3	47.9	66.1	61.4	6.3	7.5	6.7	6.8	5	9	16	16	0	3	0	3	0
May	21	6	6	11	16	8	9	10	6	44.7	44.6	47.3	45.5	74.6	46.9	67.1	62.9	5.6	6.1	4.5	5.4	13	5	13	12	0	0	0	4	0
June	11	7	5	23	20	11	3	1	9	58.2	61.4	60.8	60.1	83.7	58.0	76.3	72.7	5.5	7.9	5.7	6.4	3	17	10	18	0	0	3	9	0
July	18	11	8	18	6	11	5	5	11	59.9	62.1	63.2	61.7	83.8	55.5	79.2	72.8	5.4	6.1	4.3	5.3	6	19	6	16	0	0	4	10	0
Aug	11	2	8	5	20	15	10	13	14	57.1	58.3	60.4	58.6	84.4	55.5	77.9	72.6	3.4	6.5	3.5	4.5	14	10	7	10	0	0	1	6	0
Sept	12	4	1	9	25	25	4	5	5	56.3	58.7	59.1	58.0	84.5	57.7	76.9	73.0	4.9	6.4	4.1	5.1	8	13	9	9	0	0	1	5	0
Oct	10	8	4	2	19	24	5	14	7	43.8	46.0	46.7	45.5	81.1	55.2	76.6	71.0	3.4	5.0	3.5	4.0	13	12	6	10	0	3	0	2	0
Nov	30	7	2	6	11	12	4	6	12	26.6	30.8	29.7	29.0	79.5	60.2	76.5	72.1	3.1	5.5	4.1	4.2	13	13	4	6	3	18	0	0	0
Dec	34	16	0	8	11	9	3	10	2	9.6	12.7	11.2	11.2	75.3	67.7	75.0	72.7	6.5	7.3	7.0	6.9	3	12	16	14	18	28	0	0	0
Sums	257	100	53	120	167	148	78	107	73	420.6	457.4	462.9	446.9	920.6	683.8	875.7	826.8	62.0	79.3	60.4	67.2	94	148	124	145	60	125	9	41	0
	Percentages.																					Percentages.								
Means	23.4	9.1	4.8	10.9	15.2	13.5	6.7	9.7	6.7	35.0	38.1	38.6	37.2	76.7	57.0	73.0	68.9	5.2	6.6	5.0	5.6	25.7	40.4	33.9	39.6	16.4	34.2	2.5	11.2	0.0

*Mean, thirty days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.54 a. m., 1.54 p. m., and 9.54 p. m., local time.

Correction for instrumental error of barometer used: From 5.54 a. m., January 1, to 9.54 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.970; February, 0.970; March, 0.960; April, 0.930; May, 0.890; June, 0.880; July, 0.880; August, 0.880; September, 0.890; October, 0.920; November, 0.950; December, 0.960.

F. W. CONRAD,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DETROIT, MICH.

Location of office on December 31, 1884, Chamber of Commerce building, corner Jefferson avenue and Griswold street.

[Latitude, 42° 20′ N.; longitude, 83° 3′ W. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 71 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	29.402	29.349	29.387	29.379	30.005	27	28.649	2	1.356	19.2	24.4	20.4	21.3	51.5	30	— 6.0	5	57.5	27.9	13.1	2.08	.35	2	33	W., SW.	2 3	SW.	7,719
Feb	29.331	29.298	29.291	29.307	29.832	10	28.555	19	1.277	28.2	33.7	30.0	30.6	64.3	19	— 5.8	29	70.1	38.7	22.6	3.39	.55	19	36	SW.	12 20	N.	6,737
Mar	29.320	29.293	29.296	29.303	29.724	30	28.646	26	1.078	31.0	39.8	35.0	35.6	62.0	23	3.0	2	59.0	42.4	27.5	2.10	.41	19	36	S.	11	N.	6,639
Apr	29.247	29.213	29.230	29.230	29.681	21	28.495	15	1.186	40.5	51.4	44.6	45.5	70.5	28	30.1	6	40.4	55.3	37.2	1.54	.41	15, 16	39	SE.	27	N.	5,582
May	29.248	29.209	29.227	29.228	29.624	29	28.838	19	.786	54.3	64.8	57.6	58.9	81.1	21	35.9	29	45.2	68.8	49.5	2.88	.54	4, 6, 7	36	W.	2	S.	6,886
June	29.395	29.351	29.354	29.367	29.677	15	29.018	9	.659	66.2	75.7	69.2	70.4	90.0	23	48.0	20	42.0	80.5	60.4	1.92	.81	23, 24	36	SW.	24	E.	5,182
July	29.226	29.184	29.196	29.202	29.425	21	28.932	31	.473	64.2	76.3	69.0	69.8	88.8	1	51.2	8	37.6	79.3	60.5	3.76	1.35	30, 31	29	SW.	5	W.	5,878
Aug	29.354	29.318	29.321	29.329	29.650	9	28.942	29	.708	64.0	75.7	68.4	69.4	90.0	18 20	46.0	9	44.0	78.3	60.0	1.55	.86	28, 29	25	SW.	8	S.	5,699
Sept	29.367	29.323	29.352	29.347	29.757	13	28.914	28	.843	63.5	74.0	67.6	68.4	88.8	10	45.0	21	43.8	76.1	59.7	2.70	.67	28	38	SW.	24	S.	5,945
Oct	29.424	29.387	29.397	29.408	29.806	14	29.029	8	.777	51.9	61.6	55.4	56.3	85.0	8	27.8	24	57.2	65.0	47.2	1.96	.91	21, 22	30	S.	27	S.	7,254
Nov	29.330	29.310	29.362	29.331	29.674	6	28.626	23	1.048	36.6	43.0	39.1	39.6	62.2	23	14.4	24	47.8	46.6	32.4	1.74	.68	4	40	SE.	23	SW.	7,492
Dec	29.358	29.341	29.372	29.357	29.890	26	28.557	6	1.333	27.7	33.2	30.7	30.5	60.0	6	— 6.1	19	66.1	37.0	23.5	3.06	.68	14, 15	39	SW.	8	S.	8,601
Sums	352.002	351.571	351.775	351.783	......	...	......	...	11.524	548.2	653.6	587.0	596.3	....	....	......	...	610.7	695.4	493.6	28.17	....	......	...	....	....	....	79,614
Means	29.334	29.298	29.315	29.316	30.005	*27	28.495	†15	.960	45.7	54.5	48.9	49.7	90.0	‡23 §18 §20	—6.1	‖19	50.9	58.0	41.1	....	...	......	...	....	....	S.	......

* January. † April. ‡ June. § August. ‖ December.

DETROIT, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	6	4	1	2	14	26	20	13	7	11.9	17.0	13.2	14.0	72.6	72.7	73.3	72.9	7.4	7.1	6.7	7.1	3	13	15	18	17	29	0	0	0
Feb	16	8	4	8	14	11	14	10	2	22.9	26.3	23.9	24.4	80.2	74.1	77.7	77.3	7.6	8.8	7.6	8.0	1	11	17	25	9	25	0	0	0
Mar	20	11	10	8	11	15	8	9	1	26.5	29.1	27.0	27.5	78.9	66.3	72.2	72.5	6.2	6.7	5.3	6.1	5	16	10	15	8	18	0	1	1
Apr	18	9	15	6	1	9	7	14	11	31.7	33.5	32.4	32.5	71.5	52.8	63.7	62.7	4.8	6.0	4.7	5.2	10	11	9	8	0	3	0	1	0
May	5	8	7	12	21	12	16	9	3	42.8	46.0	45.1	44.6	65.6	54.1	64.3	61.3	4.5	6.0	3.4	4.6	11	15	5	15	0	0	0	2	0
June	8	17	18	13	13	2	5	10	4	57.8	59.3	58.2	58.4	74.7	58.6	69.0	67.4	3.8	5.0	3.0	3.9	13	12	5	13	0	0	0	7	0
July	12	11	4	5	11	15	18	16	1	54.6	57.9	57.7	56.7	71.5	54.6	68.0	61.7	3.8	6.7	2.9	4.5	10	17	4	13	0	0	0	6	0
Aug	7	5	10	10	20	19	9	13	0	55.0	58.9	58.3	57.4	73.2	57.2	70.9	67.1	2.9	4.9	2.1	3.3	18	10	3	13	0	0	0	1	0
Sept	5	7	6	9	40	9	8	6	0	55.2	57.6	58.0	56.9	74.6	58.3	72.0	68.3	3.2	4.0	1.8	3.0	15	14	1	9	0	0	0	2	0
Oct	11	8	2	4	29	15	14	9	1	41.7	45.7	46.2	44.5	68.6	57.3	71.8	65.9	5.1	6.0	3.7	4.9	11	11	9	9	0	2	0	0	0
Nov	3	5	2	7	15	24	14	20	0	27.9	32.5	31.7	30.7	70.9	67.6	75.1	71.2	5.9	6.2	5.1	5.7	10	6	14	15	3	14	0	0	0
Dec	7	5	4	10	27	17	16	7	0	19.7	25.8	23.5	23.0	71.4	73.9	74.2	73.2	6.2	8.5	7.2	7.3	4	11	16	24	11	21	0	0	0
Sums	118	98	83	94	216	174	149	136	30	447.7	489.6	475.2	470.6	873.7	747.5	852.2	824.5	61.4	75.9	53.5	63.6	111	147	108	177	48	112	0	20	1
	Percentages.																					Percentages.								
Means	10.7	8.9	7.6	8.6	19.6	15.8	13.6	12.4	2.7	37.3	40.8	39.6	39.2	72.8	62.3	71.0	68.7	5.1	6.3	4.5	5.3	30.3	40.2	29.5	48.4	13.1	30.6	0	5.5	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 6.36 a. m., January 1, to 10.36 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.760; February, 0.750; March, 0.750; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.740 December, 0.760.

REMARKS.—September 19, at 2.41 p. m., an earthquake was felt, lasting about five seconds; the duration of the shock, *i. e.*, while the building quivered, was twenty seconds. No damage was reported in the city.

N. B. CONGER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DODGE CITY, KANS.

Location of office on December 31, 1884, Hoover's Block.

[Latitude, 37° 45′ N.; longitude, 100° 0′ W. Elevation of barometer above sea-level, 2,517 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 37 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	27.534	27.505	27.542	27.527	28.004	4	26.981	9	1.023	18.8	35.2	28.2	25.6	66.5	28	—11.0	24	77.5	37.4	11.4	.08	.07	15	44	SE.	26	W., NW.	9,133
Feb	27.407	27.374	27.404	27.395	27.697	25	26.710	18	.987	22.1	35.8	27.7	28.5	65.0	24	—5.0	12 14	70.0	39.4	16.6	.28	.12	7	44	SE., NW.	15 19	NW.	9,001
Mar	27.827	27.271	27.301	27.300	27.763	14	26.561	10	1.202	33.1	51.8	40.5	41.8	76.0	10	6.0	8	70.0	55.0	29.3	1.91	.96	17	56	SW.	10	SE.	12,316
Apr	27.341	27.298	27.342	27.327	27.689	20	26.817	13	.872	40.4	59.6	47.4	49.1	80.0	25	26.0	21	54.0	62.5	37.1	1.07	.38	11, 12	64	SE.	28	NW.	11,583
May	27.396	27.373	27.393	27.387	27.726	8	26.942	4	.784	52.8	68.7	57.4	59.5	87.0	9	32.0	2	55.0	71.8	48.2	4.47	.79	16	52	W., E.	5 29	SE.	9,423
June	27.423	27.398	27.416	27.412	27.552	2	27.194	7	.358	65.0	79.1	69.5	71.2	92.5	30	52.0	9	40.5	82.2	60.7	7.67	2.04	17	36	SE.	6	SE.	7,556
July	27.378	27.360	27.362	27.367	27.579	20	27.182	4	.397	68.8	85.3	75.8	76.6	97.8	8	58.5	31	39.3	88.6	66.5	6.40	3.18	16	56	NE.	9	SE.	9,795
Aug	27.464	27.438	27.450	27.451	27.721	4	27.185	1	.536	64.3	80.5	70.9	71.9	94.0	28	55.0	4	39.0	82.2	62.2	4.82	2.42	9	42	SE.	1	SE.	8,874
Sept	27.361	27.341	27.360	27.354	27.732	20	27.063	23	.669	61.4	81.1	68.3	70.8	92.0	3	45.6	28	46.4	82.9	59.3	.23	.22	4, 5	42	SE.	5	SE.	11,296
Oct	27.499	27.470	27.495	27.488	27.779	28	27.217	1	.562	50.4	66.9	55.5	57.6	83.2	17	29.5	30	53.7	69.9	47.7	1.50	.79	1	48	SE.	1	SE.	10,248
Nov	27.498	27.465	27.509	27.491	27.792	4	27.037	21	.755	23.1	52.5	39.3	41.6	71.5	7	12.1	23	59.4	54.0	29.9	.88	.53	11, 12	38	N.	16	NW.	6,358
Dec	27.414	27.392	27.428	27.411	27.891	24	26.896	4	.995	15.4	27.5	20.1	21.0	67.2	2	—11.8	25	79.0	29.9	13.0	1.10	.88	29	47	SE.	26	NW.	8,882
Sums	329.042	328.685	329.002	328.910	....	...	......	..	9.140	524.6	724.0	595.6	614.7	....	....	...		683.8	755.3	481.9	80.86	....	......	...	....	....	... ...	114,415
Means	27.420	27.800	27.417	27.409	28.004	*4	26.561	†10	.762	42.7	60.3	49.6	51.2	97.8	‡8	—11.8	§25	57.0	62.9	40.2	....	...	......	...	....	....	SE.	......

* January. † March. ‡ July. § December.

DODGE CITY, KANS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	4	2	12	8	12	22	22	1	10.9	13.7	14.5	13.0	73.3	47.0	70.2	63.5	1.8	3.9	1.6	2.4	18	12	1	2	11	29	0	0	0
Feb	15	7	5	17	4	7	11	21	0	16.1	19.3	19.7	18.4	78.3	57.3	74.2	69.9	4.1	6.7	5.5	5.4	8	13	8	8	11	27	0	0	0
Mar	4	13	9	26	7	5	11	17	1	24.8	27.4	26.3	26.2	72.3	43.7	60.7	58.9	3.4	5.2	2.6	3.7	15	12	4	6	2	20	0	1	0
Apr	12	3	11	16	9	2	13	24	0	31.9	30.0	33.7	31.9	71.6	36.7	60.4	56.2	4.5	5.7	4.0	4.7	10	13	7	5	0	10	0	1	0
May	14	2	15	24	3	3	18	14	0	45.7	46.2	48.5	46.8	79.5	48.5	72.6	66.9	6.3	6.0	4.8	5.7	4	18	9	19	0	0	0	10	0
June	3	8	15	40	8	4	6	9	2	60.3	61.7	62.7	61.6	85.1	57.7	79.8	74.2	3.6	3.5	4.0	3.7	13	14	3	11	0	0	5	9	0
July	5	28	9	32	9	1	3	6	0	62.2	65.2	65.2	64.2	80.4	52.5	71.0	68.0	4.2	2.5	3.5	3.4	13	16	2	8	0	0	11	8	0
Aug	10	10	14	32	15	3	3	6	0	59.4	61.0	62.0	60.8	84.8	53.5	74.5	70.9	5.3	4.3	3.3	4.3	12	13	6	10	0	0	2	1	0
Sept	6	3	5	45	15	2	2	12	0	54.6	54.3	56.5	55.1	79.0	41.6	66.9	62.5	3.0	1.8	2.1	2.3	19	8	3	3	0	0	4	1	0
Oct	5	3	7	38	16	3	8	13	0	46.2	46.5	47.8	46.8	85.9	51.4	76.2	71.2	3.6	3.6	2.2	3.1	18	7	6	8	0	1	0	0	0
Nov	14	2	4	11	9	11	10	26	3	29.2	32.5	31.0	30.9	85.7	51.7	73.1	70.2	2.6	3.7	1.8	2.7	19	8	3	5	2	18	0	0	0
Dec	16	3	5	25	3	1	7	32	1	12.3	16.0	14.8	14.4	87.9	68.1	80.9	79.0	4.4	6.1	4.8	5.1	11	11	9	8	19	29	0	0	0
Sums ..	114	86	101	318	106	54	109	202	8	453.6	473.8	482.7	470.1	963.8	609.7	860.5	811.4	46.8	52.0	40.2	46.5	160	145	61	93	45	134	22	31	0
	Percentages.																					Percentages.								
Means .	10.4	7.8	9.2	29.0	9.7	4.9	9.9	18.4	0.7	37.8	39.5	40.2	39.2	80.3	50.8	71.7	67.6	3.9	4.3	3.4	3.0	43.7	39.6	16.7	25.4	12.3	36.6	6.0	8.5	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time correspond to 5.28 a. m., 1.28 p. m., and 9.28 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.75; February, 2.74; March, 2.73; April, 2.64; May, 2.55; June, 2.51; July, 2.50; August, 2.48; September, 2.55; October, 2.63; November, 2.74; December, 2.80.

REMARKS.—Last killing frost, April 21; last light frost, May 2; first light frost, October 8; first killing frost, October 30.

J. E. LANOUETTE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DUBUQUE, IOWA.

Location of office on December 31, 1884, corner Sixth and Main streets.

[Latitude, 42° 30′ N.; longitude, 90° 44′ W. Elevation of barometer above sea-level, 665 feet. Elevation of exposed thermometer above ground, 82 feet. Elevation of rain-gauge above ground, 43 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan......	29.451	29.420	29.444	29.438	29.901	5	28.817	13	1.084	9.4	18.5	14.3	14.1	44.0	13	—23.8	5	67.8	23.0	4.5	.99	.44	1, 2	19	W.	30	W.	4,278
Feb......	29.330	29.294	29.309	29.311	29.767	10	28.744	19	1.023	17.3	26.5	22.8	22.2	41.7	1	— 7.5	15	49.2	31.0	12.4	2.19	.44	12	19	NW. W. W.	19 21 25	NW.	4,452
Mar	29.299	29.280	29.305	29.295	29.716	30	28.449	11	1.267	26.9	37.5	32.3	32.2	65.2	27	— 3.8	4	69.0	40.5	23.7	3.85	1.02	25	28	E.	28	N. NW.	4,132
Apr	29.252	29.213	29.234	29.233	29.737	21	28.608	15	1.129	41.7	55.4	48.2	48.4	81.0	30	27.0	8	54.0	59.1	37.7	2.77	.95	1	28	SW.	27	NW.	4,905
May	29.250	29.214	29.214	29.226	29.687	29	28.855	18	.832	53.5	67.4	59.2	60.0	81.0	21 22	38.7	29	42.3	71.0	49.8	4.88	1.48	1, 2	16	S. NW.	5 13	S.	4,098
June.....	29.335	29.301	29.301	29.312	29.579	14	29.009	8	.570	62.9	75.7	67.3	68.6	90.2	30	46.7	10	43.5	80.2	59.0	4.89	1.48	1, 2	20	NW.	30	E.	2,973
July	29.243	29.211	29.201	29.218	29.501	20	28.991	4	.510	63.5	77.5	69.0	70.0	91.7	22	51.5	6	40.2	82.0	59.8	5.30	2.15	23	26	NE.	23	NW.	3,093
Aug	29.335	29.304	29.302	29.314	29.668	9	28.998	29	.670	61.4	76.6	67.1	68.4	90.0	19	48.9	8	41.1	79.6	58.4	4.25	1.63	17, 18	18	W.	29	S.	3,278
Sept	29.298	29.250	29.267	29.272	29.673	20	28.758	28	.915	61.1	75.6	66.9	67.9	92.5	8	47.1	20	45.4	78.2	58.3	4.07	1.44	23	26	S.	23	S.	3,750
Oct	29.404	29.357	29.374	29.378	29.791	14	29.059	5	.782	49.5	62.0	53.9	55.1	85.0	3	27.7	28	57.3	64.4	47.1	4.16	1.69	7	20	W.	5	S.	3,773
Nov.	29.382	29.358	29.370	29.370	29.784	6	28.766	22	.968	31.0	42.5	35.4	36.3	64.6	9	— 1.2	24	65.8	46.8	27.4	1.43	1.00	22, 23	20	NW.	23	NW.	2,839
Dec......	29.392	29.374	29.378	29.380	29.978	25	28.658	6	1.320	18.5	24.2	21.1	21.3	53.3	3	—17.1	19	70.4	29.2	13.7	4.08	1.34	30	20	W.	31	NW.	3,071
Sums ..	351.971	351.576	351.694	351.747	......	..	......	..	11.020	496.7	639.4	557.5	564.5	...	....	....	.	646.0	685.0	451.8	42.86	...	......	...	....	...	....	44,142
Means.	29.331	29.298	29.308	29.312	29.978	*25	28.449	†11	.918	41.4	53.3	46.5	47.1	92.5	‡8	—23.8	§5	53.8	57.1	37.6	.....	..	......	...	....	...	S.	......

* December.

† March.

‡ September.

§ January.

DUBUQUE, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.					
										Washington time.																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																		Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan....	12	1	0	6	17	12	27	18	0	—2.1	2.5	2.2	.9	59.2	50.1	58.9	56.1	5.5	4.4	4.2	4.7	12	11	8	10	22	30	0	0	0	Frozen.					
Feb...	6	15	5	7	12	6	14	21	1	8.0	15.1	12.8	12.0	67.0	62.0	65.4	64.8	7.0	7.8	6.4	7.1	2	14	18	18	17	27	0	0	0						
Mar ...	16	12	6	11	9	10	11	16	2	18.0	23.1	21.8	21.0	68.8	57.8	65.6	64.1	7.3	6.9	5.9	6.7	5	13	13	16	9	17	0	1	1	*12 9	26	11 5	27	1 4	12 2
Apr ...	5	16	14	7	11	1	9	18	9	32.5	30.1	35.1	32.6	70.7	41.5	61.7	58.0	5.7	6.5	5.7	6.0	7	11	12	14	0	2	0	8	1	13 2	4, 8	10 6	22 23 24	2 8	11 8.6
May ...	15	5	7	8	18	13	12	11	4	43.5	41.5	46.8	43.9	69.9	44.2	65.5	59.9	5.1	4.9	5.8	5.1	10	11	10	16	0	0	0	8	0	11 6	16	9 2	31	2 4	10 6
June...	5	7	24	22	16	4	1	4	7	57.5	59.2	60.4	59.0	82.9	58.5	78.8	73.4	5.4	5.3	3.8	4.7	9	15	6	15	0	0	1	5	0	9 7	4, 8	7 10	30	1 9	8 10.5
July ...	5	4	4	14	12	4	9	24	17	57.4	56.6	60.2	58.1	80.5	50.5	74.3	68.4	5.4	4.7	3.0	4.4	10	15	6	15	0	0	1	10	0	7 8	1	4 8	22	3 5	5 7.9
Aug ...	1	8	4	13	17	12	10	18	15	56.6	56.1	59.8	57.5	84.5	50.5	77.9	71.0	3.6	5.1	2.5	3.7	14	14	8	12	0	0	0	8	0	5 5	7	8 8	17 19 20	1 9	4 2 7
Sept ...	2	3	4	14	41	3	9	5	9	55.1	57.9	58.2	57.1	80.9	56.0	74.3	70.4	4.3	5.2	4.4	4.6	10	14	6	13	0	0	1	5	0	14 6	24, 25	8 10	1, 2	10 8	8 5.8
Oct	3	2	5	11	30	13	14	10	5	43.9	48.6	46.0	44.5	81.1	53.8	75.3	69.9	4.1	4.1	4.1	4.1	14	10	7	10	0	8	0	2	0	14 7	16	9 1	31	5 6	12 3.9
Nov ...	4	6	4	8	13	7	8	25	15	24.6	27.2	27.4	26.4	77.0	55.0	72.6	68.2	4.2	3.9	3.4	3.8	14	11	5	8	8	17	0	0	0	8 9	1, 2, 8	3 5	30	5 4	7 3.5
Dec ...	14	0	2	7	11	2	20	21	16	12.1	13.9	13.7	13.2	75.8	64.5	78.4	71.1	7.4	6.9	6.8	7.0	5	8	18	18	15	25	0	0	0	†5 8	13, 14	3 6	1	2 2	4 8
Sums	88	74	79	128	207	87	144	191	100	407.1	426.8	444.4	426.2	897.8	643.9	843.7	795.3	65.0	65.7	55.0	61.9	112	147	107	165	66	121	8	82	2	......	......	......	....	......	......
	Percentages.																					Percentages.														
Means	8	6.7	7.2	11.7	18.9	7.9	13.1	17.4	9.1	33.9	35.6	37.0	35.5	74.8	53.7	70.8	66.3	5.4	5.5	4.6	5.2	30.6	40.2	29.2	45.1	18.0	33.1	.8	8.7	.5	......	......	......	...	......	......

*7 days.

†17 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time.

Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m. December 31, 1884, inclusive, +.000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.770; February, 0.760; March, 0.750; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.700; October, 0.720; November, 0.750; December, 0.770

A. W. BROWNE, *Sergeant, Signal Corps, U. S. A.*

Meteorological summary for the year ending December 31, 1884—Continued.

DULUTH, MINN.

Location of office on December 31, 1884, Metropolitan Block.

[Latitude, 46° 48′ N.; longitude, 92° 6′ W. Elevation of barometer above sea-level, 672 feet. Elevation of exposed thermometer above ground, 60 feet. Elevation of rain-gauge above ground, 56 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.406	29.370	29.387	29.388	29.865	5	28.596	18	1.269	—0.4	11.0	5.2	5.3	44.9	17	—31.0	24	75.9	15.8	—6.3	.67	.17	25	36	NW.	2	SW.	5,342
Feb	29.338	29.323	29.330	29.330	29.881	11	28.674	18	1.207	2.9	12.1	7.8	7.6	30.2	25	—19.4	15	49.6	15.1	—2.5	2.71	.45	24, 25	37	NW.	19	NE.	5,794
Mar	29.291	29.264	29.283	29.279	29.758	29	28.394	11	1.364	15.4	27.5	23.4	22.1	53.8	24	—16.9	8	70.7	30.0	11.3	1.32	.37	22, 23	40	NE.	10	NE.	5,179
Apr	29.311	29.281	29.298	29.297	29.900	21	28.627	27	1.273	32.9	38.8	36.4	36.0	59.7	3	24.8	21	34.9	41.7	31.2	3.64	1.19	26, 27	50	NE.	14	NE.	7,336
May	29.242	29.214	29.240	29.232	29.800	29	28.933	19	.867	45.7	52.6	48.3	48.9	79.5	30	33.2	2	46.3	58.8	40.8	5.17	3.02	22	40	NE.	27	NE.	6,466
June	29.346	29.309	29.302	29.319	29.626	14	29.053	7	.573	56.8	59.7	56.5	57.7	85.1	29	39.8	12	45.3	65.8	50.4	1.18	.80	7, 8	46	NE.	24	NE.	5,048
July	29.199	29.180	29.182	29.187	29.451	20	28.921	5	.530	60.5	66.0	60.8	62.4	84.2	28	48.3	8	35.9	70.8	56.2	3.45	.99	4, 5	30	NE.	17 24	NE.	6,446
Aug	29.257	29.229	29.241	29.242	29.621	8	28.863	20	.758	60.2	68.1	62.9	63.7	83.0	13	48.4	23	34.6	71.1	57.7	6.92	2.19	19, 20	28	NE. SW.	1 18 20	NE.	5,856
Sept	29.191	29.166	29.196	29.184	29.666	13	28.776	15	.890	53.7	62.4	56.3	57.5	81.4	2	44.6	18	36.8	64.6	52.2	4.70	1.70	8	41	NE.	30	NE.	6,306
Oct	29.300	29.276	29.302	29.293	29.756	14	28.674	5	1.082	42.7	51.3	46.1	46.7	77.8	19	19.4	23	58.4	54.6	40.2	3.47	1.60	5	46	NE.	1 2	W.	6,883
Nov	29.325	29.318	29.339	29.326	29.685	17	28.833	26	.852	24.2	34.4	28.6	29.1	60.8	12	—17.0	24	77.8	36.7	21.0	0.95	.64	22	44	NW.	28	W.	6,152
Dec	29.357	29.337	29.377	29.357	29.911	25	28.800	8	1.111	7.4	14.0	9.6	10.8	47.2	4	—32.5	18	79.7	16.9	2.6	1.22	.27	20	42	NW.	31	NW.	5,484
Sums ..	351.563	351.262	351.477	351.434	....	...	...	...	11.776	402.0	497.9	442.1	447.8		...	......	...	645.4	539.9	354.8	35.35	....	....	...	....	....	....	72,242
Means .	29.297	29.272	29.290	29.286	29.911	*25	28.394	†11	.981	33.5	41.5	36.8	37.3	85.1	‡29	—32.5	*18	53.8	45.0	29.6	.....	....	....	...	....	....	NE.	......

* December. † March. ‡ June.

DULUTH, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	3	7	3	2	13	22	20	17	6	— 4.0	1.8	0.3	— 0.6	85.2	67.5	80.2	77.6	4.6	5.2	3.2	4.3	12	14	5	12	27	31	0	0	0
Feb	4	27	5	0	3	5	9	14	20	— 1.4	0.2	2.0	0.3	81.9	59.1	77.1	72.7	6.0	7.4	5.9	6.4	4	16	9	22	29	29	0	0	0
Mar	3	30	2	0	0	12	17	4	25	9.1	15.7	15.1	13.3	75.3	61.2	70.5	69.0	4.7	4.9	3.0	4.2	12	13	6	13	17	29	0	0	1
Apr	13	47	3	0	1	1	4	11	10	26.9	26.5	29.1	27.5	78.8	65.5	75.4	73.2	5.5	5.5	5.3	5.4	11	7	12	13	0	16	0	1	1
May ..	7	40	12	0	0	5	11	14	4	37.3	35.9	37.5	36.9	75.0	58.9	68.9	67.6	5.2	4.6	3.4	4.4	12	11	8	9	0	0	0	0	0
June ...	4	47	15	1	2	5	2	0	14	50.3	50.8	51.4	50.8	80.2	74.5	80.6	78.4	4.1	5.6	2.1	3.9	13	14	8	13	0	0	0	1	0
July	8	26	14	0	4	3	23	15	5	52.8	52.9	52.8	52.8	76.2	65.6	76.4	72.7	4.4	6.6	4.4	5.1	7	19	5	16	0	0	0	2	1
Aug	8	21	8	1	7	11	18	13	6	55.2	56.5	56.3	56.0	84.1	69.0	80.1	77.7	4.2	6.6	4.7	5.2	7	16	8	17	0	0	0	4	0
Sept	6	26	7	0	3	17	17	10	4	49.6	50.6	49.8	50.0	86.4	68.9	79.1	78.1	5.6	7.4	4.2	5.7	5	17	8	20	0	0	0	4	3
Oct	11	18	3	0	4	19	21	15	2	37.1	38.3	36.4	37.3	81.5	64.3	71.9	72.6	6.0	6.0	5.8	5.9	5	15	11	16	0	7	0	0	0
Nov	7	4	4	0	4	26	28	15	2	20.1	24.4	22.3	22.3	84.0	68.5	77.8	76.8	3.8	4.4	4.1	4.1	13	11	6	8	11	21	0	0	0
Dec	4	3	1	4	12	25	13	29	2	2.5	7.7	4.9	5.0	79.9	70.1	80.9	79.0	6.6	6.8	6.1	6.5	5	13	13	18	24	30	0	0	0
Sums ..	73	296	77	8	53	151	183	157	100	335.5	361.3	357.9	351.6	968.5	799.1	918.9	895.4	60.7	71.0	52.2	61.1	106	166	94	177	108	163	0	12	6
	Percentages.																					Percentages.								
Means .	6.6	27.0	7.0	0.7	4.8	13.8	16.7	14.3	9.1	28.0	30.1	29.8	29.3	80.7	66.6	76.6	74.6	5.1	5.9	4.4	5.1	29.0	45.4	25.7	48.4	29.5	44.5	0	3.3	1.6

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 a. m., 2 p. m., and 10 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.790; February, 0.790; March, 0.770; April, 0.750; May, 0.730; June, 0.710; July, 0.700; August, 0.700; September, 0.720; October, 0.740; November, 0.770; December, 0.800.

REMARKS.—Office moved December 1, 1884. Elevation of barometer lowered 13 feet; thermometer raised 8 feet. Authority, telegram and letter of November 3 and 4.

E. R. BRACE,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

EASTPORT, ME.

Location of office on December 31, 1884, United States Custom-House, northwest corner of Water and Washington streets.

[Latitude, 44° 54′ N.; longitude, 66° 59′ W. Elevation of barometer above sea-level, 61 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.												Precipitation.			Wind.					
	Washington time.									Washington time.				Self-registering thermometers.									Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.	30.010	29.964	29.967	29.977	30.678	28	28.906	2	1.772	14.6	20.6	17.6	17.6	45.0	9	— 8.0	16	53.0	24.9	10.1	4.37	1.11	9	46	SE.	9	SW.	9,137
Feb.	30.032	29.937	29.969	29.979	30.684	16	28.647	29	2.037	22.3	27.6	24.2	24.7	45.0	14	4.5	29	40.5	31.9	17.1	9.38	3.17	23, 24	55	NE.	28	NE., NW.	7,858
Mar	29.881	29.841	29.872	29.865	30.333	11	29.329	29	1.004	24.7	31.7	28.1	28.2	48.0	22 24	—.6	5	48.6	34.2	21.9	3.74	1.02	27	41	NE.	8	NW.	8,306
Apr	29.706	29.683	29.719	29.703	30.129	15	28.779	4	1.350	37.9	43.8	38.0	39.9	57.0	24	28.0	3	29.0	45.0	34.6	6.83	2.27	16	50	NE.	3	NE.	6,263
May	29.848	29.803	29.838	29.830	30.271	31	29.228	11	1.043	44.8	51.3	43.5	46.5	72.8	26	34.2	30	38.6	53.6	39.6	6.79	2.05	8, 9	32	NE.	9	S.	5,522
June	29.980	29.928	29.935	29.946	30.417	14	29.599	24	.818	55.4	64.2	52.7	57.4	82.0	28	39.3	1	42.7	66.3	48.4	2.18	.63	20	21	NE.	2	S.	3,341
July	29.721	29.692	29.719	29.710	30.036	4	29.325	14	.711	57.6	63.4	54.9	58.6	80.6	3	45.0	21	35.6	65.4	51.2	8.48	2.40	9	30	SE.	20	S.	4,191
Aug	29.972	29.933	29.961	29.955	30.189	13	29.670	31	.519	58.9	66.5	57.6	61.0	85.5	18	46.0	25	39.5	68.8	53.8	4.41	1.87	13, 14	26	NW.	24	S.	3,188
Sept*	29.967	29.916	29.951	29.945	30.303	27	29.495	16	.808	54.4	61.7	*53.5	56.5	82.8	5	37.6	14	45.2	63.9	50.0	1.89	.62	11	29	S.	16	S.	4,239
Oct	29.983	29.917	29.954	29.951	30.499	26	29.429	17	1.070	43.6	48.5	44.0	45.4	67.9	1	27.4	16	40.5	51.9	39.8	1.88	.54	25	34	NE.	31	NW.	7,590
Nov	29.888	29.866	29.884	29.879	30.434	22	29.094	29	1.340	34.6	38.6	36.1	36.4	54.0	24	16.0	19	38.0	43.1	30.1	5.93	1.79	4, 5	40	S.	24	NW.	7,282
Dec	30.001	29.978	29.971	29.983	30.712	27	29.207	7	1.505	24.2	28.2	26.4	26.3	51.3	7	—21.0	20	72.3	33.5	19.5	8.63	3.04	21, 22	48	SE.	15	NW.	8,219
Sums	358.986	358.433	358.730	358.723		...	......	...	13.977	473.0	546.1	476.6	498.5	....		......	...	523.5	582.5	415.6	64.53	..	......	...	......	...	......	75,090
Means	29.916	29.871	29.894	29.894	30.712	†27	28.647	‡20	1.165	39.4	45.5	39.7	41.5	85.5	§18	—21.0	†20	43.6	48.5	34.6	..	..	......	...	....	....	S.	......

* One 11 p. m. observation taken late.

† December.

‡ February.

§ August.

EASTPORT, ME.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	17	6	5	2	9	21	9	17	7	8.1	12.4	12.4	11.0	75.0	70.6	78.9	74.8	6.5	6.2	5.9	6.2	8	7	16	17	18	30	0	0	1
Feb	12	16	3	6	9	8	7	16	10	17.0	22.0	19.4	19.5	79.8	79.8	81.8	80.5	6.1	7.4	7.4	7.0	3	12	14	21	15	27	0	0	1
Mar	14	11	8	3	11	9	6	26	5	18.7	23.4	21.4	21.2	77.8	72.2	75.8	75.3	6.7	7.8	6.1	6.9	5	10	16	15	11	22	0	0	4
Apr	19	24	11	2	6	3	5	9	11	33.2	35.4	33.5	34.0	83.6	74.6	84.3	80.8	6.2	7.1	6.0	6.4	6	12	12	21	0	5	0	1	2
May	9	9	7	4	19	5	9	9	22	38.5	39.1	38.8	38.8	79.8	67.2	84.2	77.1	6.6	6.2	4.8	5.9	8	12	11	17	0	0	0	3	0
June.....	10	7	2	0	27	9	1	7	27	47.2	49.7	47.2	48.0	74.9	61.6	82.3	72.9	4.4	4.7	3.5	4.2	14	9	7	8	0	0	0	4	0
July	9	6	1	4	33	7	7	11	15	52.8	54.7	51.8	53.1	84.8	75.2	89.6	83.2	5.5	7.2	4.0	5.6	5	19	7	18	0	0	0	4	2
Aug	5	3	4	1	41	2	4	7	26	54.7	56.8	53.9	55.1	86.4	72.8	87.9	82.4	3.1	5.1	2.0	3.4	14	12	5	12	0	0	0	2	0
Sept	4	6	4	2	24	13	10	10	16	49.0	49.7	49.1	49.3	82.1	66.9	85.6	78.2	5.1	4.4	4.0	4.5	9	14	6	12	0	0	0	1	5
Oct	18	4	3	2	14	16	5	26	5	36.9	37.9	37.0	37.8	77.5	68.2	77.0	74.2	5.1	7.2	5.3	5.9	8	12	11	12	0	8	0	1	7
Nov	7	2	4	0	14	16	15	23	9	28.6	30.4	29.8	29.6	78.5	72.8	78.1	76.5	5.6	6.4	5.7	5.9	6	14	10	11	0	19	0	0	1
Dec	18	4	6	4	11	14	10	19	7	18.7	21.0	21.9	20.5	79.2	74.4	83.0	78.9	6.9	5.6	6.0	6.2	5	13	13	14	11	23	0	0	2
Sums ..	142	98	58	30	218	123	88	180	160	403.4	432.5	416.2	417.4	959.4	856.3	988.5	934.8	67.8	75.3	60.7	68.1	91	146	128	178	55	129	0	16	25
	Percentages.																					Percentages.								
Means .	12.9	8.9	5.3	2.8	19.9	11.2	8.0	16.4	14.6	33.6	36.0	34.7	34.8	80.0	71.4	82.4	77.9	5.6	6.3	5.1	5.7	24.9	40.0	35.1	48.6	15.0	35.2	.0	4.4	6.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.40 a. m., 3.40 p. m., and 11.40 p. m., local time.

Correction for instrumental error of barometer used: From 7.40 a. m., January 1, to 11.40 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.060; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—January, remarkably brilliant sunsets on 5th, 6th, 25th, and 26th, snow from cloudless sky in early a. m. of 21st; February, most severe storm for two years occurred on 28th; March, heaviest snowfall of season occurred on 8th; April, first light and heavy frosts of season occurred on 12th and 23d, respectively; May, frost observed and ice formed one-eighth to one-fourth inch thick on the 30th; June, remarkable for absence of fog; July, cold, foggy, disagreeable month; August, noted for unusual number of foggy days, there being eight days foggy against two for August, 1883; September, noted for absence of gales; October, first snow of season occurred on 14th, precipitation is 6.43 inches less than for October, 1883; November, rain-storm on 24th, 1.60 inches fell in four hours; December, an unusually large number of gales occurred remarkable for extremes of pressure and temperature.

D. C. MURPHY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ELLIOTT, FORT, TEX.

Location of office on December 31, 1884, soldiers' barracks.

[Latitude, 35° 30′ N.; longitude, 100° 21′ W. Elevation of barometer above sea-level, 2,650 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	27.367	27.339	27.380	27.362	27.797	4	26.830	9	.967	23.6	40.4	28.1	30.7	75.0	13	.7	24	74.3	44.0	19.3	.61	.37	14	45	N.	10	N.	9,713
Feb	27.227	27.197	27.234	27.219	27.520	22	26.696	18	.824	27.2	45.6	32.9	35.2	74.2	20	1.5	13	72.7	49.6	24.3	.27	.12	11	44	SW.	18	NE.	8,939
Mar	27.173	27.127	27.159	27.153	27.553	14	26.634	10	.919	36.2	56.6	43.7	45.5	80.0	10	16.5	7	63.5	60.4	33.0	.34	.12	16, 23	68	SW.	27	SE.	11,127
Apr	27.184	27.144	27.167	27.165	27.483	20	26.790	13	.693	42.6	63.4	49.6	51.9	86.0	25	28.0	21	58.0	67.2	39.6	1.08	.70	28	48	SE.	28	N.	10,476
May	27.224	27.203	27.217	27.215	27.518	8	26.864	4	.654	53.3	72.0	59.2	61.5	89.6	12	36.0	2	53.6	75.5	50.9	*6.20	*2.75	29	44	N., NW.	1 14	S.	8,015
June†	27.257	27.227	27.246	27.244	27.408	17	27.031	7	.377	64.6	80.9	70.7	72.1	93.0	30	53.2	1	39.8	84.5	62.1	6.86	1.27	1	44	NE.	1	S.	6,570
July	27.222	27.193	27.199	27.205	27.359	20	27.070	4	.289	70.1	90.6	79.0	79.9	99.1	29	61.8	28	37.3	93.8	67.9	1.29	.51	20	35	S W.	25 26	S.	7,572
Aug	27.299	27.275	27.283	27.286	27.530	4	27.057	1	.473	66.0	83.1	72.7	73.9	100.8	2	53.8	30	47.0	86.1	64.4	5.60	1.68	5	40	W	24	SE.	7,094
Sept	27.238	27.197	27.220	27.217	27.517	20	26.915	23	.602	63.5	84.2	70.9	72.9	95.0	16	46.0	2[illegible]	49.0	86.9	61.5	.84	.41	5	40	NE.	24	SE.	8,144
Oct	27.354	27.321	27.352	27.342	27.588	23	27.070	26	.509	52.1	68.8	57.3	59.4	87.0	5	33.5	30	53.5	71.2	49.9	5.54	1.74	20, 21	31	S.	2 19	S.	7,288
Nov	27.337	27.305	27.349	27.330	27.606	6	26.903	22	.703	37.2	55.7	41.0	44.6	72.3	8	19.5	23	52.8	58.3	38.1	2.14	1.01	16, 17	46	NW.	27	NW.	6,170
Dec	27.224	27.192	27.239	27.218	27.675	31	26.647	4	1.028	21.9	32.6	24.2	26.2	67.8	2	—2.0	24	69.8	36.8	16.8	8.05	1.57	10	60	N.	4	NW.	9,453
Sums	327.103	326.720	327.045	326.956	....	...	....	..	8.038	558.3	773.9	629.3	653.8	.....	.....	......	.	671.3	813.8	522.8	38.91	.....	.....	...	....	...	....	100,441
Means	27.259	27.227	27.254	27.246	27.797	‡4	26.634	§10	.670	46.5	64.5	52.4	54.5	100.8	‖2	—2.0	¶24	55.9	67.8	43.6	....	.....	.....	...	....	....	S.	....

* Rain gauge overflowed. † Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed. ‡ January. § March. ‖ August. ¶ December.

ELLIOTT, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point. Washington time.				Relative humidity (per cent.). Washington time.				Cloudiness (in tenths). Washington time.				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	19	12	1	9	15	12	6	11	8	17.8	17.8	19.3	18.3	80.2	46.4	70.9	65.8	3.0	4.0	2.5	3.2	18	9	4	8	7	25	0	0	0
Feb	10	19	2	12	15	9	2	12	6	22.5	21.8	23.2	22.5	83.8	47.6	71.5	67.6	4.3	4.5	3.5	4.1	11	11	7	1	4	24	0	0	0
Mar	9	13	1	23	15	10	2	12	8	28.6	22.3	25.6	25.5	74.6	38.2	54.3	54.0	3.6	3.7	1.5	2.9	16	13	2	3	0	13	0	1	0
Apr	26	4	5	15	12	7	2	11	8	32.5	29.5	32.9	31.6	70.1	30.1	56.4	52.2	5.5	3.8	2.4	3.9	12	16	2	8	0	2	0	2	0
May	11	17	4	17	19	5	3	12	5	47.3	44.8	49.2	47.1	82.0	42.8	72.0	65.6	5.8	5.3	4.8	5.3	7	17	7	10	0	0	0	6	0
June* ...	5	4	3	19	33	2	0	10	8	60.3	63.6	62.9	62.3	86.9	56.5	77.2	73.5	3.8	4.1	3.6	3.8	11	16	0	13	0	0	5	5	0
July	2	7	4	20	43	4	1	0	12	61.2	60.5	62.2	61.3	74.5	38.1	58.0	56.9	3.3	2.2	2.6	2.7	16	15	0	9	0	0	26	4	0
Aug.....	2	13	11	24	23	10	0	5	5	59.7	60.7	60.9	60.4	81.1	49.9	68.3	66.4	4.6	3.7	4.4	4.2	13	13	5	12	0	0	8	7	0
Sept....	4	9	3	28	26	5	3	1	11	56.6	54.9	57.0	56.4	79.1	39.2	64.6	61.0	2.6	2.6	2.2	2.5	17	13	0	5	0	0	10	1	0
Oct	12	1	0	18	34	3	2	6	17	48.6	50.9	50.3	49.9	88.0	55.4	78.8	74.1	4.1	4.6	2.8	3.8	16	9	6	10	0	0	0	1	0
Nov.....	13	0	1	6	17	6	1	34	12	33.2	35.8	35.9	35.0	86.2	50.3	82.3	72.9	3.6	4.0	2.3	3.3	18	7	5	6	0	12	0	0	0
Dec	23	0	0	8	18	1	9	29	5	17.9	20.4	19.0	19.1	85.6	66.7	81.8	78.0	3.6	5.7	4.4	4.6	13	9	9	7	13	28	0	0	0
Sums ..	136	99	35	199	270	74	31	143	105	486.2	483.0	499.0	489.4	972.1	556.2	836.1	788.0	47.8	48.2	37.0	44.8	168	148	47	82	24	†104	49	27	0
	Percentages.																					Percentages.								
Means.	12.5	9.1	3.2	18.2	24.7	6.8	2.8	13.1	9.0	40.5	40.2	41.0	40.8	81.0	46.4	69.7	65.7	4.0	4.0	3.1	3.7	46.3	40.8	12.9	‡22.4	‡.6	‡28.4	†13.5	.7	0

* Two 7 a. m., two 3 p. m., two 11 p. m. observations missed.

† 364 days.

‡ 366 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.27 a. m., 1.27 p. m., and 9.27 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive +.001 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.900; March, 2.830; April, 2.780; May, 2.700; June, 2.670; July, 2.640; August, 2.640; September, 2.690; October, 2.790; November, 2.930; December, 2.960.

J. C. RICKLI,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ERIE, PA.

Location of office on December 31, 1884, Fifth and State streets.

[Latitude, 42° 7′ N.; longitude, 80° 5′ W. Elevation of barometer above sea-level, 681 feet. Elevation of exposed thermometer above ground, 82 feet. Elevation of rain-gauge above ground, 59 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°	°	°	°	°	*In.*	*In.*						*Miles.*
Jan	29.373	29.329	29.359	29.354	30.015	27	28.674	2	1.341	18.3	23.3	20.5	20.7	48.5	30	—10.0	25	58.5	27.9	12.4	4.59	1.53	8, 9	34	SW.	2	SW.	7,376
Feb	29.296	29.281	29.285	29.287	29.833	10	28.514	19	.319	28.7	31.7	30.0	30.1	63.0	19	— 7.0	29	70.0	39.7	22.4	5.88	1.06	4, 5	32	W., S.	{21} {19}	W.	7,238
Mar	29.289	29.280	29.280	29.283	29.676	16	28.681	26	.995	30.3	35.8	33.6	33.2	§64.3	23	— 1.0	1	§65.3	§41.8	25.9	3.84	1.17	26	53	S.	11	NE.	6,789
Apr	29.200	29.181	29.195	29.192	29.632	21	28.472	2	1.160	40.1	45.0	41.7	42.3	76.0	27	26.9	7	49.1	50.2	35.2	1.99	0.65	2	36	S.	15	{ NE. W. }	6,240
May	29.217	29.198	29.212	29.209	29.555	3	28.851	19	.704	54.5	61.3	54.8	56.9	86.5	22	36.8	29	49.7	66.8	48.3	3.42	0.71	4, 5	36	W.	2	W.	6,575
June......	29.364	29.332	29.334	29.343	29.721	15	28.971	9	.750	66.7	72.2	65.8	68.2	87.8	23	51.4	26	36.4	77.3	59.8	2.40	1.50	23, 24	31	NE.	25	NE.	5,454
July......	29.179	29.164	29.167	29.170	29.357	21	28.871	31	.486	65.9	71.0	66.3	67.7	88.8	1	52.9	16	35.9	75.1	61.1	5.29	1.70	26, 27	27	W.	6	W.	6,682
Aug	29.327	29.302	29.306	29.312	29.597	9	28.903	29	.694	65.8	73.7	66.7	68.7	89.2	19	51.4	25	37.8	77.6	61.4	2.16	1.33	3, 4	24	W.	30	S.	5,852
Sept	29.364	29.323	29.342	29.343	29.755	14	28.976	28	.779	64.3	71.8	66.0	67.4	86.8	4	43.4	14	43.4	75.2	60.2	3.92	1.15	28	26	SW.	24	S.	6,175
Oct	29.407	29.379	29.382	29.389	29.791	25	28.980	8	.811	52.8	59.3	54.7	55.6	79.9	4	31.4	26	48.5	63.4	48.4	3.23	0.95	1, 2	36	NW.	23	S.	8,248
Nov	29.311	29.281	29.328	29.307	29.670	3	28.656	23	1.014	38.5	44.4	39.4	40.8	64.7	10	15.8	24	48.9	47.8	33.5	4.91	0.90	23, 24	40	S.	23	SW.	8,569
Dec	29.358	29.325	29.359	29.347	29.877	26	28.553	6	1.324	31.8	36.2	32.7	33.6	61.2	31	5.9	19	55.3	38.7	26.7	3.84	0.80	6, 7	41	W.	7	S.	10,465
Sums ..	351.685	351.375	351.549	351.536	......	...	......	..	10.377	557.7	625.7	572.2	585.2	......	...	....	..	598.8	681.5	495.3	45.47	.....	......	...	....	....	....	85,658
Means .	29.307	29.281	29.296	29.295	30.015	*27	28.472	†2	.865	46.5	52.1	47.7	48.8	89.2	‡9	—10.0	*25	49.9	56.8	41.3	......	.....	......	...	....	....	S.	......

* January. † April. ‡ August. § Eighteen days only.

ERIE, PA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	5	12	1	4	16	37	10	6	2	14.4	17.9	16.1	16.1	84.6	79.9	82.6	82.4	8.7	9.0	7.9	8.5	2	6	23	21	18	29	0	0	0
Feb	8	19	8	2	15	8	24	7	1	25.1	26.8	25.6	25.7	85.8	80.4	83.5	83.2	8.6	9.1	8.1	8.6	0	8	21	24	5	24	0	1	0
Mar	8	24	2	4	14	9	17	8	7	25.4	27.5	26.9	26.6	81.9	72.5	76.7	77.0	5.8	7.7	6.3	6.6	1	20	10	18	*4	17	0	0	0
Apr	3	23	4	4	4	10	23	10	9	33.4	33.2	34.4	33.7	77.7	65.4	76.0	73.0	6.4	5.8	4.2	5.5	9	11	10	12	0	5	0	1	0
May	4	11	3	5	21	16	22	8	8	44.7	46.0	45.6	45.4	71.2	59.4	72.2	67.6	5.9	5.5	3.8	5.1	10	13	8	16	0	0	0	3	0
June	10	26	7	8	18	5	9	6	1	57.4	56.8	57.7	57.3	72.6	60.0	75.7	69.4	2.9	3.2	2.4	2.9	18	9	3	7	0	0	0	2	0
July	7	10	2	1	11	13	27	22	0	57.4	57.6	57.1	57.4	74.9	63.7	73.4	70.7	4.9	4.3	3.8	4.3	10	18	3	11	0	0	0	5	0
Aug	12	8	6	4	24	14	16	9	0	57.1	59.3	57.3	57.9	73.9	61.5	72.4	69.3	3.3	2.7	2.3	2.8	20	8	3	7	0	0	0	1	0
Sept	8	5	4	8	24	17	10	14	0	56.2	57.7	56.2	56.7	75.5	62.7	72.0	70.1	3.9	5.2	2.9	4.0	12	12	6	10	0	0	0	1	2
Oct	7	12	4	5	21	16	13	15	0	45.3	47.9	47.5	46.9	76.2	67.0	77.9	73.7	6.0	5.9	5.3	5.7	10	10	11	16	0	1	0	1	0
Nov	3	4	3	2	20	28	13	17	0	33.2	36.7	33.5	34.5	81.4	75.1	79.4	78.6	7.1	7.9	6.6	7.2	4	9	17	12	0	12	0	0	0
Dec	5	7	1	8	31	19	14	8	0	25.9	27.4	26.9	26.7	78.6	70.3	79.2	76.0	8.4	7.7	8.6	8.2	2	5	24	20	9	22	0	0	0
Sums	80	161	40	55	219	192	198	130	23	475.5	494.8	484.8	484.9	934.8	817.9	921.0	891.0	71.9	74.0	62.2	69.4	98	129	139	174	36	110	0	15	2
	Percentages.																					Percentages.								
Means	7.3	14.7	3.6	5.0	19.9	17.5	18.0	11.8	2.1	39.6	41.2	40.4	40.4	77.9	68.2	76.8	74.3	6.0	6.2	5.2	5.8	26.8	35.2	38.0	47.5	10.2	30.1	0	4.1	0.5

* Eighteen days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 a. m., October 10, inclusive, +.000 inch; from 11 a. m., October 10, to 11 p. m., December 31, 1884, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants to the various months: January, 0.770; February, 0.770; March, 0.770; April, 0.750; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.710; October, 0.730; November, 0.760; December, 0.770.

P. WOOD,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ESCANABA, MICH.

Location of office on December 31, 1884, Adler's Building, corner Ludington and Doneman streets.

[Latitude, 45° 48′ N.; longitude, 87° 5′ W. Elevation of barometer above sea-level, 613 feet. Elevation of exposed thermometer above ground, 25 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.403	29.370	20.397	29.390	29.948	26	28.631	30	1.317	3.1	14.4	8.4	8.6	38.2	30	—17.5	4	55.7	18.8	— .3	.55	.18	29, 30	34	N.	2	W.	7,100
Feb	29.373	29.347	29 358	29.359	29.903	10	28.734	19	1.169	3.3	17.4	9.3	10.0	37.8	19	—29.3	29	67.1	19.2	— .2	2.75	.56	4, 5	31	NW.	19	N.	6,488
Mar**	29.351	29.309	29.331	29.330	29.816	30	28.453	11	1.363	11.5	30.5	21.2	21.1	52.8	28	—26.8	1	79.6	32.0	9.8	1.10	.54	10, 11	37	N.	29	N.	5,750
Apr	29.327	29.284	29.311	29.307	29.908	21	28.603	15	1.305	31.2	42.9	34.8	36.3	60.0	24	19.0	6	41.0	44.8	28.3	2.60	1.32	15	37	N.	20	N.	7,377
May	29.250	29.235	29.247	29.244	29.724	29	28.874	19	.850	45.1	54.4	47.8	49.1	71.4	30	30.6	2	40.8	57.8	41.3	2.69	.72	19	34	N.	15	N.	6,959
June	29.404	29.370	29.364	29.379	29.730	14	29.097	30	.633	58.1	69.1	60.5	62.6	81.0	19	42.8	10	38.2	71.7	53.5	2.52	.84	8, 9	31	N.	24	S.	5,776
July	29.210	29.198	29.212	29.207	29.453	7	28.789	5	.664	57.5	70.0	60.4	62.6	78.8	20	45.7	14	33.1	71.8	54.2	3.01	.54	11	28	N., W.	4, 22	N.	5,843
Aug	29.315	29.296	29.293	29.301	29.689	8, 9	28.957	3	.732	57.7	68.9	61.6	62.7	81.0	14	40.0	8	41.0	70.4	54.6	4.71	1.18	20	36	S.	2	S.	5,792
Sept	29.279	29.262	29.280	29.274	29.818	13	28.658	24	1.160	55.9	65.5	59.0	60.1	79.1	4	41.0	20	38.1	67.7	53.5	8.77	2.81	23, 24	30	N.	24	S.	6,256
Oct	29.368	29.328	29.349	29.348	29.869	14	28.834	5	1.035	43.2	52.2	47.1	47.5	77.6	3	22.4	23	55.2	55.6	40.4	7.97	3.30	1, 2	36	{NW., N.}	8, 20	S.	8,034
Nov	29.330	29.299	29.337	29.322	29.681	17	28.720	23	.961	25.5	35.7	29.8	30.3	62.6	14	— 5.0	24	67.6	38.1	23.0	2.14	1.52	22, 23	32	NW.	23	W.	6,790
Dec	29.340	29.333	29.356	29.343	29.959	25	28.684	6	1.275	16.9	23.3	19.0	19.7	45.5	4	—14.1	26	59.6	26.4	18.5	4.84	1.06	6, 7	33	NW	22	{N., NW.}	6,719
Sums	351.950	351.631	351.835	351.804	......	..	......	.	12.464	409.0	544.3	458.9	470.6	...	......	......	...	617.0	573.8	371.1	43.15	....	......	...	....	....	....	78,884
Means	29.329	29.303	29.320	29.317	29.959	*25	28.453	†11	1.039	34.1	45.4	38.2	39.2	81.0	{‡19 §14}	—29.3	‖29	51.4	47.8	30.9	.....	....	......	...	....	....	S.	......

** Two 7 a. m. observations missed.

* December.

† March.

‡ June.

§ August.

‖ February.

ESCANABA, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	20	0	0	5	23	8	24	13	0	— 2.4	5.3	3.0	2.0	77.3	66.9	78.0	74.1	5.7	6.0	4.1	5.3	10	12	9	10	26	31	0	0	2
Feb	38	1	1	4	19	3	8	12	1	— .9	5.7	4.0	2.9	78.1	60.8	79.0	72.6	6.0	6.8	7.1	6.6	3	16	10	21	27	29	0	0	1
Mar**	34	5	4	9	22	4	5	10	0	8.8	16.9	15.8	13.8	79.4	57.6	79.1	72.2	5.7	5.8	4.5	5.3	8	15	8	13	12	28	0	0	8
Apr	41	6	5	4	19	1	3	11	0	25.4	27.4	27.1	26.6	78.6	57.3	73.7	69.9	5.7	4.8	4.6	5.0	10	10	10	13	1	23	0	1	2
May	31	5	8	12	15	4	5	13	0	36.8	38.7	39.1	38.2	73.7	58.0	73.0	68.2	7.1	5.7	5.0	5.9	3	19	9	20	0	2	0	0	0
June	20	2	5	18	41	1	0	1	2	51.2	54.5	53.0	52.9	78.1	60.9	76.7	71.9	5.1	4.2	4.3	4.5	10	16	4	15	0	0	0	5	3
July	27	7	3	7	16	5	18	10	0	50.6	52.6	52.2	51.8	78.3	55.7	75.0	69.7	5.2	6.2	4.5	5.3	5	19	7	21	0	0	0	11	2
Aug	15	1	0	12	36	5	8	12	4	52.2	55.1	56.0	54.4	82.3	63.0	82.1	75.8	4.8	6.1	5.1	5.3	7	15	9	17	0	0	0	8	0
Sept	10	5	3	8	38	5	10	8	3	50.9	53.3	52.9	52.4	83.6	67.2	80.7	77.2	5.5	5.9	5.6	5.7	4	19	7	23	0	0	0	10	2
Oct	9	3	5	6	28	10	13	19	0	37.6	39.2	39.2	38.7	81.0	65.1	75.1	73.7	5.4	6.7	5.5	5.9	6	13	12	17	0	5	0	1	8
Nov	9	3	0	1	21	3	29	24	0	20.4	24.7	23.8	23.0	80.5	64.8	78.1	74.5	6.2	6.3	5.1	5.9	6	13	11	15	9	22	0	0	0
Dec	21	1	1	3	13	8	19	21	6	11.1	14.8	13.3	13.1	77.1	70.1	77.6	74.9	7.4	7.6	6.5	7.2	4	10	17	20	19	26	0	0	8
Sums	275	39	35	89	291	57	142	154	16	341.7	388.2	379.4	369.8	948.0	747.4	928.1	874.7	69.8	72.1	61.9	67.9	76	177	113	205	94	166	0	36	26
	Percentages.																					Percentages.								
Means	25.0	3.6	3.2	8.1	26.5	5.2	12.9	14.0	1.5	28.5	32.4	31.6	30.8	79.0	62.3	77.3	72.9	5.8	6.0	5.2	5.7	20.8	48.4	30.9	56.0	25.7	45.4	.0	9.8	7.1

**Two 7 a. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.20 a. m., 2.20 p. m., and 10.20 p. m., local time.

Correction for instrumental error of barometer used: From 6.20 a. m., January 1, to 10.20 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.710; April, 0.690; May, 0.660; June, 0.650; July, 0.640; August, 0.640; September, 0.660; October, 0.670; November, 0.700; December, 0.720.

REMARKS.—On March 1, at 1.30 a. m., the elevation of the barometers were changed from 612 feet to 613 feet, by authority dated office of the Chief Signal Officer, February 14, 1884.

L. M. PINDELL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

FORT SMITH, ARK.

Location of office on December 31, 1884, Government building, Garrison avenue.

[Latitude, 35° 22′ N.; longitude, 94° 24′ W. Elevation of barometer above sea-level, 451 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 29 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In*						*Miles.*
Jan	29.800	29.753	29.799	29.784	30.294	5	29.260	10	1.034	24.3	37.2	30.1	30.5	68.6	30	— 5.0	5	73.6	42.4	20.4	1.35	.65	14	28	W., E.	1, 14	E.	4,687
Feb	29.580	29.572	29.603	29.585	29.962	14	29.026	19	.936	37.4	46.7	42.0	42.0	75.4	4	9.5	14	65.9	53.2	33.0	10.72	5.56	10, 11	34	NW.	19	E.	4,222
Mar	29.531	29.494	29.519	29.515	29.948	9	29.045	27	.903	44.9	59.9	51.5	52.1	82.8	26	23.5	2	59.3	64.7	42.6	2.28	.70	24, 25	28	N.	1	E.	5,629
Apr	29.49[illegible]	29.446	29.458	29.465	29.783	3	29.058	14	.725	50.6	65.0	57.3	57.6	88.0	17	35.8	9	52.7	70.1	48.9	2.62	.88	20, 21	28	W., NW.	1, 2	E.	4,638
May	29.502	29.465	29.484	29.484	29.713	30	29.243	11	.470	60.4	77.7	66.5	68.2	91.6	12	46.0	2	45.6	81.1	58.9	3.70	1.15	3	32	N.	18	E.	2,625
June	29.51[illegible]	29.475	29.486	29.491	29.651	28	29.308	24	.348	68.4	83.5	74.0	75.3	99.5	30	54.0	11	45.5	89.5	67.0	2.41	1.13	17, 18	20	W.	6	E.	2,466
July	29.480	29.441	29.447	29.456	29.630	20	29.255	30	.375	74.0	90.4	79.2	81.2	104.5	8	65.4	11	39.1	96.7	72.1	5.98	1.62	27	28	N.	3, 27	E.	2,650
Aug	29.585	29.544	29.555	29.561	29.744	9	29.343	28	.401	69.0	85.1	74.5	76.2	103.7	28	58.4	11	45.3	90.1	68.0	3.73	2.97	14, 15	24	N.	22	E.	2,720
Sept	29.548	29.493	29.516	29.519	29.747	20	29.249	23	.498	69.2	87.7	75.1	77.3	99.9	7	58.8	1	41.1	92.2	68.2	5.03	2.30	16, 17	14	E., N.	4, 17	E.	3,078
Oct	29.685	29.635	29.659	29.660	29.995	23	29.418	26	.577	56.7	74.8	61.5	64.3	94.6	5	39.0	28	55.6	79.3	55.0	1.32	.67	25, 26	16	N., NW.	8	E.	2,510
Nov*	29.705	29.612	29.602	29.680	30.070	6	29.138	22	.932	42.3	59.5	47.3	49.7	77.8	1	22.5	24	55.3	63.0	40.5	5.19	1.71	21, 22	24	W., NW.	22, 23	E.	2,607
Dec	29.620	29.568	29.615	29.601	30.059	18	29.109	5	.950	32.6	42.1	35.7	36.8	72.5	4	12.2	24	60.3	46.5	29.5	6.80	1.64	26, 27	24	W.	11	W.	4,464
Sums	355.041	354.528	354.883	354.801		....	.	...	8.149	629.8	809.6	694.7	711.2	.....	...	......	...	639.3	868.8	604.1	50.63	....	......	...	....	.....		43,296
Means	29.587	29.544	29.569	29.567	30.294	†5	29.026	‡19	.679	52.5	67.5	57.9	59.3	104.5	§8	— 5.0	5	53.3	72.4	50.3	...	....	.....	..	....	.....	E.	......

* Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed. † January. ‡ February. § July.

FORT SMITH, ARK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan	17	3	31	1	4	2	10	9	16	19.4	21.1	22.6	21.0	81.3	54.4	73.6	69.8	4.8	4.6	4.0	4.5	12	12	7	8	7	24	0	0	−1	7	6	−3	6	26	1	11	−2	4.9
Feb	15	4	29	0	4	2	13	8	12	32.5	32.7	33.1	32.8	83.1	62.6	72.3	72.7	6.1	6.3	6.5	6.3	5	10	14	12	1	10	0	0	+21	0	14	−1	7	2	22	7	+6	3.3
Mar	12	1	35	6	10	2	14	7	6	37.0	38.0	39.6	38.2	75.4	48.0	65.9	63.1	5.6	5.7	4.0	5.1	9	14	8	11	0	4	0	0	+1	0	1	−1	10	23	2	10	−0	8.5
Apr	13	0	15	4	14	1	8	12	23	44.0	42.3	47.2	44.5	79.7	48.9	71.0	66.5	6.6	6.5	6.0	6.4	6	8	16	14	0	0	0	0	+3	3	26	−1	7	12	4	10	−0	2.1
May	9	4	21	6	14	1	13	2	23	55.6	55.4	57.6	56.2	84.4	48.4	73.0	68.6	6.1	5.2	3.8	5.0	6	18	7	3	0	0	2	0	+16	3	4	+0	2	31	16	1	+4	2.5
June	8	4	22	5	4	1	17	2	27	64.9	65.0	67.5	65.8	88.3	56.0	80.8	75.0	3.9	6.0	2.5	4.1	11	15	4	6	0	0	15	0	+5	0	3	−0	7	23	5	7	+1	2.7
July	6	0	24	1	10	11	7	2	32	70.6	71.2	72.3	71.4	89.2	55.0	80.1	74.8	4.2	4.2	2.2	3.5	13	15	3	9	0	0	28	1	+2	8	1	−1	4	19 23	4	0	−0	3.5
Aug	11	5	34	2	3	0	8	3	27	65.4	66.8	67.7	66.6	88.2	55.9	79.8	74.6	5.2	4.9	3.4	4.5	9	16	6	7	0	0	14	0	−0	10	21 26	−3	5	13 14	2	7	−1	11.9
Sept	4	3	36	5	18	1	3	0	20	65.5	68.9	68.2	67.5	88.2	55.1	80.0	74.4	4.2	4.4	2.8	3.8	14	12	4	7	0	0	18	0	−0	3	2	−4	4	16	4	1	−3	3.1
Oct	11	4	25	5	6	1	5	5	31	53.7	55.0	56.2	55.0	90.0	52.0	83.2	75.1	4.2	3.8	2.3	3.4	14	13	4	8	0	0	7	0	+5	3	5	−3	10	22	9	1	−1	0.6
Nov*	11	4	19	3	1	4	6	8	28	38.2	41.1	40.9	40.1	85.1	53.1	78.7	72.3	3.7	4.2	3.8	3.9	11	10	7	6	0	5	0	0	+2	0	28	−4	9	16	6	9	−2	4.9
Dec	2	14	22	1	0	3	27	9	15	28.9	32.3	31.2	30.8	86.1	70.5	83.8	80.1	6.1	6.2	5.8	6.0	6	13	12	12	5	17	0	2	+10	7	31	−3	5	27	14	0	+1	2.0
Sums	119	46	313	39	88	29	131	67	260	575.7	589.8	604.1	589.9	1019.0	659.9	922.2	867.0	60.7	62.0	47.1	56.5	116	156	92	103	13	60	84	3	......		...	......		...	94	4	+0	7.0
	Percentages.																					Percentages.																	
Means	10.9	4.2	28.7	3.6	8.1	2.7	12.0	6.1	23.8	48.0	49.2	50.3	49.2	84.9	55.0	76.8	72.2	5.1	5.2	3.9	4.7	31.9	42.9	25.3	28.3	3.6	16.5	23.1	.8	+21	0	†14	−4	9	‡16	7	10.3	+0	0.6

* Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed. † February. ‡ November.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.51 a. m., 1.51 p. m., and 9.51 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1 to 3 p. m., May 12, inclusive, +.001 inch; from 7 p. m., May 12 to 11 p. m., December 31, 1884, inclusive, +.057 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.500; February, 0.500; March, 0.490; April, 0.480; May, 0.470; June, 0.460; July, 0.460; August, 0.460; September, 0.470; October, 0.480; November, 0.490; December, 0.500.

REMARKS.—Elevation changed from 449 to 451 feet; authorized by letter dated August 25, 1884. River was higher February 14 than it has been since 1877; river was above danger line on the 3d and 4th of May. Tornado passed near the station on the 27th of July.

ISAAC M. CLINE,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

GALVESTON, TEX.

Location of office on December 31, 1884, custom-house building, Mechanics street, between Twentieth and Twenty-first streets.

[Latitude, 29° 18′ N.; longitude 94° 47′ W. Elevation of barometer above sea-level, 40 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 51 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.204	30.211	30.216	30.210	30.644	21	29.760	23	.884	43.5	48.9	47.6	46.7	70.5	30	22.0	8	48.5	56.9	40.0	5.11	1.69	16, 17	38	N.	1	N.	8,058
Feb	30.053	30.037	30.061	30.050	30.415	20	29.713	18	.702	58.0	63.7	59.6	60.4	75.0	22	28.5	15	46.5	66.5	54.6	.89	.24	18	42	N.	27	S.	7,560
Mar	29.983	29.965	29.976	29.975	30.300	15	29.689	23	.611	61.4	68.4	64.6	64.8	77.3	28	41.2	1	36.1	70.4	59.6	4.84	2.96	17, 18	33	N.	17	SE.	8,214
Apr	29.930	29.922	29.931	29.928	30.224	23	29.589	14	.635	64.7	70.4	66.6	67.2	81.0	15	48.4	22	32.6	72.7	62.3	5.55	2.53	4, 5	37	N.	20	SE.	9,382
May	29.940	29.935	29.945	29.940	30.150	9	29.763	1	.387	73.1	79.4	75.1	75.9	84.4	18	59.7	8	24.7	80.8	70.3	8.42	2.27	3, 4	38	NW.	17	S.	7,064
June	29.941	29.935	29.930	29.935	30.096	2 28	29.801	5	.295	78.5	85.5	80.2	81.4	90.6	28	66.0	3	24.6	87.1	76.2	6.84	2.59	19, 20	18	S.	3	S.	8,858
July	29.964	29.956	29.947	29.956	30.085	6	29.795	10	.290	82.2	89.2	84.1	85.2	94.8	9, 10	76.0	1	18.8	90.6	80.6	1.16	.70	1	22	SW.	18	S.	5,543
Aug	29.990	29.982	29.979	29.984	30.096	4	29.846	30	.250	80.3	87.8	83.3	83.8	93.0	30	70.6	6	22.4	89.1	78.8	1.77	.78	6	21	NE.	31	SE.	6,577
Sept	29.962	29.950	29.963	29.958	30.157	20	29.802	23	.355	80.9	86.4	83.1	83.5	90.5	12, 14	74.0	4	16.5	87.8	79.0	7.04	3.02	27, 28	27	SE.	27	SE.	6,419
Oct	30.053	30.030	30.058	30.047	30.276	24	29.880	26	.396	72.1	77.6	74.6	74.8	87.2	1	57.3	30	29.9	79.7	69.7	7.37	5.12	25, 26	27	N.	22	SE.	6,760
Nov	30.120	30.089	30.126	30.112	30.462	6	29.645	22	.817	59.2	64.6	61.8	61.9	75.0	1, 4	44.5	24	30.5	68.2	56.5	4.25	2.51	22	37	NW.	22	E.	7,827
Dec	30.010	29.980	30.025	30.005	30.339	19	29.670	4	.669	55.7	59.6	57.5	57.6	72.5	21	29.3	18	43.2	65.0	50.5	9.44	4.50	28	36	N.	31	S.	9,188
Sums	360.150	359.992	360.157	360.100	....	...	......	...	6.291	809.6	881.5	838.1	843.2	....	......	......	...	374.3	914.6	778.1	62.68	....	......	...	....	....	....	86,845
Means	30.012	29.999	30.013	30.008	30.644	*21	29.589	†14	.524	67.5	73.5	69.8	70.3	94.8	‡9, 10	22.0	*8	31.2	76.2	64.8	.....	....	......	...	....	....	S.	......

* January. † April. ‡ July.

GALVESTON, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	31	13	7	16	12	3	4	7	0	38.0	40.6	42.4	40.3	79.6	74.3	81.2	78.4	5.9	5.2	4.6	5.2	9	12	10	12	0	9	0	0	0
Feb	16	3	5	17	37	2	3	4	0	53.0	53.5	52.9	53.1	84.5	72.1	80.3	79.0	5.0	6.3	2.9	4.7	7	16	6	12	0	2	0	0	0
Mar	13	10	6	25	23	9	3	4	0	56.3	56.5	58.7	57.2	84.4	68.8	82.1	78.4	6.3	6.4	5.0	5.9	8	10	13	13	0	0	0	4	0
Apr	10	5	10	25	19	8	3	10	0	59.0	60.1	60.2	59.8	82.8	71.6	80.8	78.4	5.7	5.6	4.6	5.3	8	13	9	7	0	0	0	1	0
May	7	4	14	19	38	6	2	3	0	67.8	67.5	68.9	68.1	84.0	68.6	81.8	78.1	5.7	5.2	4.5	5.1	10	10	11	12	0	0	0	7	0
June......	6	3	11	23	28	8	8	2	1	72.4	71.2	72.0	71.9	82.1	63.5	75.5	73.7	4.5	4.0	2.4	3.6	14	13	8	9	0	0	2	6	0
July	1	0	1	6	45	32	6	2	0	76.7	76.2	77.1	76.7	83.9	65.9	79.5	76.4	3.8	3.2	1.0	2.7	19	12	0	4	0	0	18	2	0
Aug	4	8	12	37	28	3	1	0	0	74.4	72.9	73.7	73.7	82.8	61.8	78.2	72.6	2.8	3.2	1.6	2.5	19	12	0	7	0	0	7	4	0
Sept	3	3	4	44	31	2	0	2	1	74.0	73.9	74.1	74.0	80.1	67.3	74.6	74.0	4.2	4.8	2.7	3.9	14	12	4	11	0	0	2	4	0
Oct	20	19	15	30	1	1	4	1	2	65.6	65.7	66.6	66.0	80.7	67.7	77.2	75.2	3.9	4.4	2.9	3.7	13	14	4	10	0	0	0	2	0
Nov	15	22	27	11	3	2	1	9	0	53.1	53.8	54.7	53.9	80.6	69.2	78.3	76.0	4.2	3.7	2.4	3.4	14	14	2	6	0	0	0	0	0
Dec	16	12	11	12	20	9	6	6	1	51.6	53.0	52.5	52.4	86.6	80.1	83.8	83.5	6.1	5.6	5.3	5.7	6	15	10	16	0	1	0	4	0
Sums ..	142	102	123	265	285	85	41	50	5	741.9	744.9	753.8	747.1	992.1	830.9	948.3	923.7	58.1	57.6	39.9	51.7	141	153	72	119	0	12	29	34	0
	Percentages.																					Percentages.								
Means .	12.9	9.3	11.2	24.1	26.0	7.7	3.7	4.6	.5	61.8	62.1	62.8	62.2	82.7	69.2	79.0	77.0	4.8	4.8	3.3	4.3	38.5	41.8	19.7	32.5	0	3.3	7.9	9.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.49 a. m , 1.49 p. m., and 9.49 p. m., local time
Correction for instrumental error of barometer used: From 5.49 a. m , January 1, to 9.49 p. m., December 31, 1884, inclusive, +.008 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

E. O'C. MACINERNEY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

GRAND HAVEN, MICH.

Location of office on December 31, 1884, Cutler House, corner Third and Washington streets.

[Latitude, 43° 5′ N.; longitude, 86° 18′ W. Elevation of barometer above sea-level, 620 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.404	29.399	29.411	29.405	29.962	26	28.773	2	1.189	18.6	23.7	20.4	20.9	43.0	29	—8.5	24	51.5	27.7	12.6	2.83	.95	1, 2	44	W.	2 3	N.	9,738
Feb	29.326	29.324	29.320	29.323	29.858	10	28.728	19	1.130	22.2	27.6	24.5	24.8	51.0	19	—2.0	20	53.0	32.1	17.3	2.72	.63	12, 13	48	NW.	20	NE.	7,745
Mar	29.349	29.317	29.322	29.329	29.787	30	28.687	25	1.100	27.7	36.3	32.1	32.0	59.8	27	5.5	2	54.3	39.8	24.8	3.86	1.89	25, 26	44	S.	11	NE.	7,305
Apr	29.295	29.262	29.279	29.279	29.771	21	28.452	15	1.319	40.2	47.7	43.2	43.7	71.8	30	28.5	6	43.3	51.6	30.4	3.83	1.10	30	34	SE.	27	NW.	8,043
May	29.267	29.259	29.257	29.261	29.718	29	28.823	1	.895	52.7	58.2	54.3	55.1	75.0	22	37.0	2	38.0	62.1	47.3	3.59	.70	1	36	W.	2	S.	7,677
June*	29.403	29.373	29.378	29.385	29.666	15	29.040	9	.626	66.1	72.7	65.1	68.0	83.6	22	49.0	26	34.6	75.2	50.0	3.82	1.65	9	28	NE.	9	NE.	5,407
July	29.257	29.243	29.236	29.245	29.501	20	28.989	5	.512	65.3	70.5	65.0	66.9	81.4	3	51.9	20	29.5	72.0	59.5	4.01	2.28	23	38	NE.	23	W.	6,339
Aug.*	29.377	29.357	29.344	29.359	29.703	9	29.000	29	.703	62.1	70.5	64.4	65.7	82.8	17	45.4	10	37.4	71.6	58.1	2.30	.83	18, 19	32	S.	18	NW.	7,045
Sept	29.364	29.341	29.346	29.350	29.776	13	28.846	24	.930	61.3	70.5	64.4	65.4	82.3	8	38.8	21	43.5	71.6	57.2	4.15	2.28	23, 24	36	S.	16	S.	7,930
Oct	29.440	29.411	29.403	29.418	29.880	14	29.085	5	.795	51.2	57.9	53.1	54.1	75.6	5	29.4	23	46.2	60.2	46.9	6.10	2.13	1, 2	39	W.	22	S.	9,585
Nov.*	29.359	29.368	29.380	29.369	29.739	6	28.640	23	1.099	35.4	41.1	38.3	38.3	58.8	9	12.0	24	46.8	45.1	31.1	2.61	1.18	22, 23	39	NW.	23	SW.	7,732
Dec	29.367	29.363	29.376	29.369	29.958	25	28.576	6	1.382	26.8	30.1	28.3	28.4	59.0	30	—12.0	26	71.0	34.6	23.0	6.80	1.64	28, 29	48	W.	7	E.	9,749
Sums	352.208	352.017	352.052	352.092	......	...	......	.	11.680	529.6	606.8	553.1	563.3	....	..	.....	...	540.1	643.6	473.2	46.62	....	......	...	....	....	....	94,295
Means	29.351	29.335	29.338	29.341	29.962	†26	28.452	‡15	.973	44.1	50.6	46.1	46.9	83.6	§22	—12.0	‖26	45.0	53.6	39.4	.....	...	......	...	....	...	S.	......

* One 7 a. m. observation taken late. † January. ‡ April. § June. ‖ December.

GRAND HAVEN, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	19	8	9	8	14	17	17	5	1	13.7	16.8	14.7	15.1	80.5	74.7	78.3	77.8	8.9	8.8	8.8	8.6	1	5	25	23	21	30	0	0	0
Feb	8	22	5	15	8	5	9	16	4	17.6	21.9	20.2	19.9	82.1	78.9	83.3	81.4	8.8	9.6	8.3	8.9	0	7	22	26	18	27	0	0	0
Mar	6	18	12	8	7	9	8	14	11	22.0	27.5	26.0	25.2	79.3	71.2	78.6	76.4	7.0	6.7	6.1	6.6	5	12	14	22	9	18	0	1	0
Apr	13	14	18	2	5	8	14	17	4	31.5	32.0	31.0	31.5	72.2	57.3	64.3	64.6	6.5	5.5	5.1	5.7	5	12	13	9	0	4	0	2	2
May	9	7	6	7	26	12	18	8	0	44.0	44.1	43.7	43.9	73.4	61.3	69.1	67.9	5.5	5.9	4.1	5.2	6	17	8	15	0	0	0	3	0
June*	4	20	14	2	15	13	15	1	5	56.7	58.0	55.8	56.8	72.6	61.6	72.8	69.0	4.7	4.8	3.8	4.4	9	16	4	8	0	0	0	5	0
July	8	4	6	6	13	14	24	15	3	57.6	58.5	57.6	57.9	76.6	66.6	77.6	73.6	5.3	5.4	3.0	4.6	7	21	3	10	0	0	0	5	0
Aug*	7	9	4	10	14	15	13	18	2	56.6	57.8	57.5	57.3	82.7	63.1	78.6	75.5	4.9	4.7	3.1	4.2	10	18	2	13	0	0	0	4	0
Sept	5	5	9	13	29	11	10	8	0	55.5	57.8	57.0	56.8	81.6	65.3	77.4	74.8	4.6	4.4	4.8	4.6	8	14	8	10	0	0	0	4	1
Oct	6	4	9	11	26	17	10	9	1	44.4	46.4	45.0	45.3	78.2	66.6	74.6	73.1	6.5	5.7	5.1	5.8	9	11	11	14	0	2	0	2	0
Nov*	9	9	6	6	8	18	15	15	3	29.8	32.4	31.2	31.1	80.0	71.6	76.0	75.9	7.3	7.0	5.6	6.6	5	10	14	13	1	15	0	0	0
Dec	8	9	19	7	18	11	13	11	2	21.8	25.1	22.9	23.3	81.4	81.3	80.5	81.1	8.8	8.6	8.6	8.7	0	6	25	19	12	21	0	0	0
Sums	97	124	112	95	178	150	166	137	36	451.2	478.3	462.6	464.1	940.6	821.5	911.1	891.1	78.8	77.1	65.9	73.9	65	149	149	182	56	117	0	26	8
	Percentages.																					Percentages.								
Means	8.8	11.3	10.2	8.7	16.3	13.7	15.1	12.5	3.3	37.6	39.9	38.6	38.7	78.4	68.4	75.9	74.2	6.6	6.4	5.5	6.2	17.9	41.0	41.0	49.7	15.3	32.0	0	7.1	.8

* One 7 a. m. observation taken late.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time.

Correction for instrumental error of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.660; June, 0.650; July, 0.650; August, 0.650; September, 0.660; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—January 2 and 3, very severe gale; harbor entrance blockaded by ice the better portion of the month. February 12, severe sleet-storm; harbor continued blockaded by heavy ice the better part of the month. March 22, heavy rise of Grand River causing damage to lumber-booms and clearing harbor of ice. April 17, 22, auroras. May 29, last light frost of season. September 21, first light frost of season; 13th, aurora. October 9, first killing frost of season; 17th, meteor. December 29 and 30, unusually warm.

JOSEPH E. MUELLER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

GRANT, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 32° 39′ N.; longitude, 109° 57′ W. Elevation of barometer above sea-level, 4,856 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	25.280	25.252	25.271	25.268	25.504	1	25.032	10	.472	33.4	48.7	42.0	41.4	59.4	8	18.8	1	40.6	52.3	32.7	1.12	.69	26	32	SE.	20	SE.	5,895
Feb	25.197	25.189	25.197	25.194	25.428	22	24.898	6	.530	39.0	51.6	46.0	45.5	72.7	25	20.3	14	52.4	54.5	38.8	4.62	1.48	3, 4	32	SW.	6	N.	4,817
Mar	25.155	25.159	25.163	25.159	25.319	13	24.955	23	.364	41.1	55.5	47.9	48.2	66.2	14	30.2	27	36.0	58.2	40.0	3.87	2.08	4	32	SW.	26	NE.	5,304
Apr	25.152	25.150	25.153	25.152	25.290	24	24.957	27	.333	45.6	62.8	54.4	54.8	77.7	24	32.4	1	45.3	65.5	44.7	.47	.21	4	32	W.	25	N.	5,594
May	25.191	25.186	25.181	25.186	25.370	8	25.023	20	.347	55.9	73.0	64.0	64.8	86.7	31	38.6	8	48.1	75.7	54.8	.81	.40	19	47	E.	8	N.	5,658
June.....	25.210	25.205	25.208	25.208	25.347	29	25.096	5	.251	66.5	83.6	73.4	74.5	99.0	25	*53.1	15	*45.9	87.1	*65.7	1.20	.47	14	32	E.	29	N.	5,028
July	25.259	25.247	25.243	25.250	25.311	7	25.111	4	.200	73.0	91.5	80.6	81.7	100.9	4	62.7	21	38.2	93.8	71.5	.67	.24	20	36	S.	10	NW.	4,708
Aug	25.270	25.257	25.251	25.259	25.358	30	25.128	18	.225	66.9	85.2	74.7	75.6	97.4	5	57.9	24	39.5	88.3	65.7	2.41	1.01	22, 23	38	S.	18	N.	3,828
Sept	25.227	25.221	25.214	25.221	25.352	15	25.013	30	.339	62.9	81.0	70.3	71.4	92.7	19	55.6	9	37.1	83.4	61.3	.98	.64	1, 2	29	SE.	11	N.	4,225
Oct	25.242	25.236	25.248	25.242	25.457	16	24.957	1	.500	57.2	70.7	62.0	63.3	85.5	5	43.0	28	42.5	78.4	55.1	3.06	1.53	9, 10	36	SE.	15	SE.	6,840
Nov	25.280	25.257	25.275	25.271	25.428	30	24.967	21	.456	46.6	65.2	52.8	54.9	78.1	1	36.7	23	41.4	67.7	45.5	.53	.40	21, 22	48	E.	6	SE.	5,554
Dec	25.178	25.139	25.167	25.160	25.445	1	24.832	27	.613	36.8	53.3	43.1	44.4	70.5	19	18.7	31	51.8	56.0	35.8	5.93	1.33	27	37	SE.	8	N., NE.	4,869
Sums ..	302.636	302.496	302.571	302.570	....	...	....	...	4.630	624.9	822.1	711.2	719.5	.....	...	....	...	518.8	855.9	611.1	25.67	....	......	...	....	....	....	61,815
Means .	25.220	25.208	25.214	25.214	25.504	†1	24.832	‡27	.386	52.1	68.5	59.3	60.0	100.9	§4	18.7	‡31	43.2	71.8	50.9	.....	....	......	...	....	....	N.	......

* Record for twenty-two days; minimum broken.

† January.

‡ December.

§ July.

GRANT, FORT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	13	12	16	10	9	8	15	0	22.4	25.1	24.0	23.8	64.6	41.7	50.8	52.2	3.8	3.4	2.5	3.2	18	9	4	4	0	16	0	0	0
Feb	19	15	7	11	8	6	5	15	1	28.9	32.7	30.7	30.8	68.8	55.1	58.8	60.9	4.5	5.1	4.2	4.6	13	7	9	11	0	2	0	0	0
Mar	14	19	10	8	6	6	14	16	0	28.3	29.3	30.8	29.5	62.7	39.5	54.2	52.1	4.4	4.6	3.2	4.1	12	13	6	12	0	2	0	1	0
Apr	25	11	12	5	2	5	18	12	0	23.8	24.1	26.6	24.8	44.8	24.6	35.8	35.1	2.1	3.5	1.9	2.5	20	9	1	4	0	0	0	0	0
May	22	10	11	13	9	4	15	9	0	27.7	28.0	30.0	28.6	38.0	21.1	31.0	30.0	2.1	2.6	1.6	2.1	23	7	2	6	0	0	0	1	0
June	23	12	14	7	11	4	6	13	0	32.4	32.8	33.8	33.0	30.1	18.5	26.1	24.9	2.1	2.6	2.8	2.5	18	11	1	5	0	0	9	3	0
July	18	7	12	11	9	4	10	21	1	45.8	45.0	46.8	45.9	40.2	21.5	33.1	31.6	2.3	2.9	3.9	3.0	17	12	2	6	0	0	25	6	0
Aug	17	10	9	13	5	3	11	9	16	49.8	49.5	51.5	50.3	57.6	32.5	48.0	46.0	3.9	4.1	4.6	4.2	11	15	5	13	0	0	15	8	0
Sept	21	17	8	12	7	2	5	15	3	44.1	44.2	44.2	44.2	54.0	30.5	42.4	42.3	1.8	2.8	1.5	2.0	24	4	2	7	0	0	2	2	0
Oct	7	15	18	34	7	5	3	3	1	44.2	46.2	44.0	44.8	63.8	45.1	54.3	54.4	3.6	3.9	2.4	3.3	13	15	3	8	0	0	0	1	0
Nov	9	13	12	16	6	9	9	5	11	30.9	35.5	31.9	32.8	55.3	35.2	46.3	45.6	1.9	2.2	0.9	1.7	24	4	2	3	0	0	0	0	0
Dec	20	20	2	16	12	5	11	7	0	25.9	32.7	28.6	29.1	66.8	50.6	60.2	59.2	4.5	4.9	4.4	4.6	14	7	10	11	0	7	0	1	0
Sums ..	205	162	127	162	92	62	115	140	33	404.2	425.1	422.9	417.6	646.7	415.9	540.5	534.3	37.0	42.6	33.9	37.8	206	113	47	90	0	27	51	23	0
	Percentages.																					Percentages.								
Means .	18.6	14.7	11.6	14.7	8.4	5.6	10.5	12.8	3.0	33.7	35.4	35.2	34.8	53.9	34.7	45.0	44.5	3.1	3.6	2.8	3.2	56.3	30.9	12.8	24.6	0	7.4	13.9	6.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8 48 p. m , local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.90; February, 4.86; March, 4.83; April, 4.78; May, 4.61; June, 4.54; July, 4.57; August, 4.57; September, 4.60; October, 4.70; November, 4.84; December, 4.88.

REMARKS.—Last snow of spring occurred on March 24; last frost of spring occurred on May 3; first frost of autumn occurred on October 28, and first snow of winter occurred on December 10.

P. CONNOR,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the last three months of the year ending December 31, 1884—Continued.

GREENCASTLE, IND.

Location of office on December 31, 1884, De Pauw University.

[Latitude, 39° 40′ N.; longitude, 86° 53′ W. Elevation of barometer above sea-level, 885 feet. Elevation of exposed thermometer above ground, 38 feet. Elevation of rain-gauge above ground, 69 feet.]

Month.	Barometer readings (corrected for temperture and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 2 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles*
Jan																												
Feb																												
Mar																												
Apr																												
May																												
June																												
July																												
Aug																												
Sept																												
Oct*	29.229	29.184	29.107	29.203	29.516	15	28.915	8	.601	52.8	64.6	56.1	57.7	85.8	2	28.2	24	57.6	66.4	50.4	1.27	.96	26, 27	24	SW.	21	SW.	3,845
Nov	29.153	29.126	29.146	29.142	29.552	6	28.562	23	.996	30.1	46.8	39.7	40.9	66.1	1	9.7	24	56.4	49.6	33.0	1.78	.60	22, 23	29	SW.	23	SW.	5,465
Dec	29.163	29.139	29.168	29.157	29.631	19	28.418	6	1.213	26.1	30.7	27.2	28.0	59.3	6	−14.5	19	73.8	35.9	20.5	6.74	1.69	27, 28	30	S.	31	SE.	6,492

Observations began 7 a. m., October 1.

GREENCASTLE, IND—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Feb	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Mar	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Apr	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
May	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
June	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
July	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Aug	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Sept	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Oct	4	8	17	5	11	27	23	8	0	47.5	49.4	49.3	48.7	83.9	61.8	79.2	74.8	3.3	4.1	2.3	3.2	15	14	2	8	0	2	0	3	0
Nov	7	14	6	9	7	23	11	13	0	31.9	35.4	34.6	34.0	84.7	65.3	82.2	77.4	4.8	4.3	3.9	4.3	13	8	9	9	1	12	0	0	0
Dec	7	11	5	24	15	9	10	12	0	22.6	24.8	23.4	23.6	86.1	79.7	85.9	83.9	8.6	7.6	7.0	7.7	5	4	22	20	11	24	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.21 a. m., 2.21 p. m., and 10.21 p. m., local time.
Correction for instrumental error of barometer used:—From 7 a. m., October 1, to 11 p. m., December 31, 1884, inclusive, +.002 inch.
REMARKS.—Station opened at 7 a. m., October 1, 1884.

ORIN PARKER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

HATTERAS, N. C.

Location of office on December 31, 1884, Neal's House.

[Latitude, 35° 15′ N.; longitude, 75° 40′ W. Elevation of barometer above sea-level, 12 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.173	30.132	30.164	30.156	30.734	27	29.405	8	1.329	41.0	43.6	41.9	42.2	68.0	24	15.0	6	53.0	50.1	34.5	7.64	2.79	8	46	SE.	8	SW.	11,024
Feb	30.095	30.076	30.118	30.096	30.554	16	29.372	28	1.182	53.0	56.3	52.6	54.0	71.0	8 9 18	27.0	29	44.0	61.4	46.3	5.18	1.60	17	45	NW.	23	NE. SW.	8,839
Mar	30.056	30.002	30.049	30.036	30.441	16	29.525	29	.916	50.8	56.8	52.4	53.3	69.8	25	26.0	4	43.8	59.8	46.2	5.84	1.58	26	40	NW.	8	NW.	8,956
Apr	29.906	29.858	29.898	29.887	30.224	12	29.241	2	.983	53.4	58.1	53.0	54.8	69.1	29	41.6	12	27.5	60.6	48.8	3.51	2.31	15	48	NW.	3	NE.	8,803
May	29.990	29.966	29.979	29.978	30.280	3	29.678	11	.602	66.3	70.7	65.5	67.5	80.5	25	48.2	1	32.3	73.5	61.7	2.66	.95	9	24	NE.	12 29	SW.	7,057
June	30.060	30.038	30.046	30.048	30.284	16	29.765	9	.519	71.2	75.6	70.5	72.4	83.2	24	56.5	2 8	26.7	77.6	66.9	2.51	.95	13, 14	23	S., NE.	15 25	SW.	6,819
July	29.933	29.906	29.923	29.921	30.127	23	29.733	16	.394	75.9	79.4	74.9	76.7	85.0	24	63.5	9	21.5	81.4	71.8	10.51	4.16	11	28	W.	31	SW.	7,806
Aug	30.034	30.019	30.030	30.028	30.186	19	29.766	30	.420	75.1	78.1	74.5	75.9	85.0	27	68.9	15	16.1	80.3	72.2	5.89	1.55	8	26	W.	1	NE.	7,462
Sept	30.114	30.087	30.113	30.105	30.275	26	29.768	17	.507	73.7	78.5	73.2	75.1	85.5	5	64.1	19	21.4	80.4	70.0	1.01	.60	12, 13	32	NE.	13	NE.	5,972
Oct	30.149	30.114	30.134	30.132	30.548	20	29.844	30	.704	65.7	70.5	66.0	67.4	83.2	6	47.0	25	36.2	73.0	62.3	1.23	.85	30, 31	32	NW.	24	NE.	6,610
Nov	30.099	30.054	30.075	30.076	30.390	7	29.519	28	.871	54.2	58.7	56.2	56.4	74.8	4	40.9	25	33.9	62.4	50.8	13.02	5.00	15, 16	46	NW.	16	NE.	6,681
Dec	30.175	30.131	30.154	30.153	30.515	28	29.771	18	.744	48.8	52.4	50.1	50.4	71.0	15	20.2	19	50.8	57.5	44.3	7.41	2.26	21, 22	41	N.	18	NE.	10,336
Sums ..	360.784	360.383	360.683	360.616	....	...	....	...	9.171	729.1	778.7	730.8	746.1	..	...	......	.	407.2	818.0	675.8	66.41	.....	......	...	....	...	....	96,316
Means .	30.065	30.032	30.057	30.051	30.734	*27	29.241	†2	.764	60.8	64.9	60.9	62.2	85.5	‡5	15.0	6	33.9	68.2	56.3	.....	.....	......	...	....	....	NE.	......

* January. † April. ‡ September.

HATTERAS, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	20	18	1	4	4	23	5	17	1	36.2	36.2	36.2	36.2	83.7	76.1	80.7	80.2	7.2	5.9	5.4	6.2	7	9	15	15	1	11	0	1	0
Feb	5	22	4	6	11	22	6	11	0	49.5	48.3	47.3	48.4	88.5	75.7	83.0	82.4	6.0	5.4	4.7	5.4	7	14	8	11	0	1	0	1	0
Mar	8	14	5	6	14	17	7	20	2	45.1	47.8	46.2	46.4	81.8	75.0	81.1	79.3	5.8	5.4	4.6	5.3	11	9	11	14	0	2	0	5	0
Apr	11	31	5	6	3	8	8	16	2	46.6	47.5	47.2	47.1	78.7	69.0	81.5	76.4	4.9	4.9	4.0	4.6	11	13	6	9	0	0	0	2	0
May	5	27	9	9	8	29	2	2	2	60.6	61.1	60.5	60.7	83.5	73.2	85.0	80.6	5.7	4.1	4.0	4.6	8	19	4	7	0	0	0	5	0
June	7	17	6	10	14	24	3	7	2	66.7	68.4	67.1	67.4	86.4	79.0	89.3	84.9	5.8	5.2	4.4	5.1	9	13	8	13	0	0	0	4	0
July	4	10	5	4	15	42	4	5	4	71.2	71.4	71.0	71.2	86.0	77.2	88.3	83.8	3.8	4.6	4.1	4.2	9	18	4	14	0	0	0	3	0
Aug	8	28	5	5	14	26	4	2	1	71.7	72.1	71.0	71.6	89.6	82.7	89.0	87.1	6.5	6.8	5.0	6.1	5	14	12	12	0	0	0	2	1
Sept	5	28	17	19	3	12	3	0	3	68.0	68.3	67.8	68.0	83.1	71.4	84.0	79.5	4.7	4.6	2.1	3.8	11	17	2	4	0	0	0	1	0
Oct	11	34	4	8	4	11	7	9	5	60.0	60.4	59.9	60.1	82.8	71.3	82.1	78.7	4.1	3.8	2.8	3.6	16	1	4	5	0	0	0	0	0
Nov	17	26	4	3	0	9	7	17	7	48.7	49.9	50.1	49.6	82.9	74.5	81.5	79.6	5.7	5.0	4.1	4.9	8	15	7	11	0	0	0	3	0
Dec	22	23	3	5	5	15	4	8	8	44.8	46.5	45.9	45.7	86.6	81.4	86.7	84.9	7.3	6.3	5.9	6.5	4	10	17	14	0	2	0	4	0
Sums ..	123	278	68	85	95	238	60	114	37	669.1	677.9	670.2	672.4	1013.6	906.5	1012.2	977.4	67.5	62.0	51.1	60.3	106	162	98	129	1	16	0	31	1
	Percentages.																					Percentages.								
Means .	11.2	25.3	6.2	7.7	8.7	21.7	5.5	10.4	3.4	55.8	56.5	55.8	56.0	84.6	75.5	84.4	81.5	5.6	5.2	4.3	5.0	29.0	44.3	26.8	35.2	0.3	4.4	0	8.5	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.06 a. m., 3.06 p. m., and 11.06 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.009 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

R. M. CRAWFORD,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

HELENA, MONT.

Location of office on December 31, 1884, corner Price and Main streets.

[Latitude, 46° 34′ N.; longitude, 112° 4′ W. Elevation of barometer above sea-level, 4,044 (B) feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*			°	°	°	°	°		°		°			*In.*	*In.*						*Miles.*
Jan	25.928	25.906	25.910	25.915	26.396	1	25.537	26	859	*7.6	*14.0	*13.8	*11.6	51.2	12	−13.0	4	64.2	24.8	10.1	3.75	1.85	2, 3	44	SW.	12	N.	2,850
Feb	25.778	25.778	25.801	25.786	26.279	26	25.101	17	1.178	11.3	17.6	14.8	14.6	52.0	24	−20.0	11	72.0	22.4	7.8	1.33	.31	4, 5	33	W.	20	NW.	3,789
Mar	25.715	25.718	25.702	25.712	26.044	13	25.138	10	.906	24.2	34.0	29.2	29.1	51.0	22 25	9.0	7	60.0	37.6	22.6	.59	.24	5	24	W., SW.	11 20	NW.	3,625
Apr	25.800	25.789	25.785	25.791	26.110	18	25.437	13	.673	35.1	47.9	41.7	41.6	63.0	22	26.0	28	37.0	51.4	33.8	1.06	.36	15, 16	25	E.	12	W.	4,080
May	25.844	25.830	25.820	25.831	26.118	29	25.544	3	.574	44.7	61.7	55.3	53.9	76.0	25 26	31.5	1	44.5	65.5	43.9	.63	.29	28	25	SW.	27	SW.	4,884
June	25.828	25.788	25.792	25.803	26.050	18	25.608	13	.442	55.2	69.5	63.9	62.9	86.0	19	43.5	25	42.5	74.3	54.2	4.29	.94	10, 11	28	S., SW.	14 20	SW.	4,656
July	25.865	25.833	25.837	25.845	26.112	8	25.541	6	.571	53.7	69.9	64.0	62.5	84.6	6	47.0	5	37.6	73.6	53.1	3.25	.80	22	34	W.	25	SW.	4,979
Aug	25.901	25.880	25.868	25.883	26.084	29	25.644	26	.440	57.5	73.9	68.9	66.8	88.2	26	42.1	20	46.1	78.8	56.1	.47	.36	19	22	W.	1	SW.	4,635
Sept	25.796	25.785	25.793	25.791	26.047	19	25.504	30	.543	44.6	54.7	49.8	49.7	74.0	21	31.0	30	43.0	59.4	42.9	1.30	.48	4, 5	29	W.	2	SW.	4,523
Oct	25.836	25.826	25.844	25.835	26.252	16	25.280	1	.972	41.4	52.8	46.8	47.0	74.0	9	28.0	7	46.0	57.6	38.6	.49	.31	2, 3	29	W.	25	W.	4,631
Nov	25.912	25.919	25.914	25.915	26.157	30	25.617	20	.540	32.8	40.1	36.3	36.4	62.0	7	7.5	22 23	54.5	45.0	28.8	.46	.28	21, 22	47	W.	26	W.	3,664
Dec	25.782	25.767	25.775	25.775	26.243	9	25.315	26	.928	5.5	9.2	6.2	7.0	52.0	2	−28.0	24	80.0	14.5	0.5	1.56	.50	18	24	W.	5	NW.	2,696
Sums	309.985	309.819	309.841	309.882	......	†1	....	...	8.626	413.6	545.8	490.2	488.1	...	.....	......	...	627.4	604.9	391.9	19.18	....	......	...	....	....	....	49,012
Means	25.832	25.818	25.820	25.823	26.396	...	25.101	‡17	.719	34.5	45.4	40.8	40.2	88.2	§26	−28.0	‖24	52.3	50.4	32.7	.....	....	......	...	....	....	W.	......

* 14 days. † January. ‡ February. § August. ‖ December.

HELENA, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	30	7	1	0	0	3	12	26	14	*1.8	*2.4	*5.3	*3.2	*76.9	*60.9	*70.4	*69.4	5.9	6.3	5.4	5.9	7	12	12	11	21	30	0	0	0
Feb	11	5	0	0	1	14	19	26	11	5.5	9.3	8.5	7.8	77.2	70.5	76.2	74.6	5.0	7.3	6.4	6.2	3	17	9	15	16	23	0	0	0
Mar	21	11	0	0	2	9	22	25	3	17.5	21.4	21.2	20.0	75.5	60.6	72.3	69.5	4.8	5.1	3.8	4.6	11	13	7	6	6	22	0	0	1
Apr	18	10	6	1	5	8	24	14	4	26.8	27.5	29.7	28.0	71.9	46.5	63.7	60.7	5.1	5.6	4.7	5.1	8	14	8	12	0	10	0	0	0
May	18	9	1	3	7	28	16	8	3	34.2	34.7	35.8	34.9	67.9	39.2	49.2	52.1	4.2	6.1	4.9	5.1	9	13	9	8	0	1	0	0	0
June......	13	7	3	0	10	48	4	3	2	45.0	45.2	45.9	45.4	69.4	44.8	54.3	56.2	3.3	5.5	5.3	4.7	10	15	5	16	0	0	0	6	1
July	11	11	5	1	1	38	19	5	2	41.0	43.3	44.5	43.9	70.5	40.5	52.0	54.3	4.1	5.1	4.0	4.4	10	17	4	11	0	0	0	3	0
Aug	10	9	11	0	3	40	15	3	2	40.9	40.9	42.5	41.4	56.9	32.5	40.6	43.3	2.9	3.9	3.5	3.4	16	13	2	2	0	0	0	0	0
Sept	17	6	2	0	.0	30	24	9	2	33.4	32.9	33.2	33.2	66.3	45.6	55.2	55.7	5.5	6.7	4.7	5.6	7	16	7	9	0	1	0	1	1
Oct	6	1	4	0	0	13	58	11	0	28.9	29.2	28.6	28.9	62.0	41.4	50.5	51.3	3.6	5.6	3.1	4.1	13	15	3	4	0	4	0	0	0
Nov	22	2	2	0	0	15	37	11	1	22.5	23.5	22.9	23.0	66.5	53.4	59.6	59.8	3.6	5.2	2.8	3.9	13	13	4	4	3	20	0	0	0
Dec	21	7	0	0	0	6	27	29	3	— 2.1	— 0.7	— 3.0	— 1.9	71.3	64.5	66.9	67.6	3.2	6.1	4.5	4.6	8	20	3	11	23	27	0	0	0
Sums ..	198	85	35	5	29	252	277	170	47	298.4	309.6	315.1	307.8	832.3	600.4	710.9	714.5	51.2	68.5	53.1	57.6	115	178	73	109	69	138	0	10	3
	Percentages.																					Percentages.								
Means .	18.0	7.7	3.2	0.5	2.6	23.0	25.2	15.5	4.3	24.9	25.8	26.3	25.7	69.4	50.0	59.2	59.5	4.3	5.7	4.4	4.8	31.4	48.6	19.9	29.8	18.9	37.7	....	2.7	0.8

* 14 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time correspond to 4.40 a. m., 12.40 p. m., and 8.40 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1 to 7 a. m., November 3, +.007 inch; 3 p. m., November 3, to 11 p. m., December 31, 1884, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.38; February, 4.35; March, 4.32; April, 4.21; May, 4.12; June, 4.07; July, 4.01; August, 4.04; September, 4.12; October, 4.25; November, 4.33; December, 4.38.

A. L. MATHEWS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

HURON, DAK.

Location of office on December 31, 1884, Parker Block, Third street.

[Latitude, 44° 21′ N.; longitude, 98° 9′ W. Elevation of barometer above sea-level, 1,305 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 36 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.780	28.725	28.764	28.756	29.424	4	28.103	9	1.321	2.9	15.1	8.7	8.9	44.3	27	—38.0	4	82.3	21.2	—5.3	.09	.03	5, 29	32	N. W.	10	N. W.	7,879
Feb	28.681	28.644	28.694	28.673	29.168	11	27.807	18	1.361	.8	11.4	4.3	5.5	44.3	1	—31.5	10	75.8	17.2	—7.8	.58	.11	4, 5	38	N. W.	18	N. W.	7,661
Mar	28.589	28.583	28.594	28.589	29.003	18	27.751	10	1.252	20.7	31.2	25.1	25.7	65.2	26	—14.6	3	79.8	37.1	16.1	1.53	.81	27, 28	46	N. W.	11	N.	6,627
Apr	28.590	28.577	28.605	28.591	29.107	20	28.031	29	1.076	34.8	49.4	41.2	41.8	72.0	25	21.7	7	50.3	52.9	32.7	2.70	.95	14	32	N. E.	1	N.	8,341
May	28.590	28.566	28.577	28.578	28.857	29	28.179	21	.678	47.4	65.8	55.0	56.1	83.0	8	30.3	2	52.7	69.5	44.9	2.90	1.14	4, 5	26	S.	21	S. E.	7,215
June	28.588	28.564	28.573	28.575	28.778	2	28.281	11	.497	61.3	78.7	68.3	69.4	93.9	29	42.9	{1 {2	51.0	82.5	58.5	3.18	1.15	7, 8	30	N.	25	S. E.	6,728
July	28.569	28.538	28.553	28.553	28.812	20	28.238	22	.574	60.0	75.9	65.3	67.1	89.5	10	48.9	5	40.6	79.9	57.6	5.11	1.19	21	42	N. W.	25	S. E.	5,624
Aug	28.615	28.577	28.588	28.593	28.899	8	28.163	19	.736	57.4	76.8	64.6	66.3	89.2	28	43.3	21	45.9	80.2	56.0	1.18	.52	16	33	N. W.	3	S. E.	7,080
Sept	28.507	28.481	28.510	28.499	28.939	19	28.049	2	.890	51.2	70.8	57.2	59.7	95.9	2	36.0	20	59.9	74.3	48.4	1.26	.71	6	34	N. W.	15	S. E.	7,921
Oct	28.642	28.603	28.619	28.621	29.018	23	28.180	10	.838	41.6	59.2	48.1	49.6	81.8	2	22.0	{23 {27	59.8	62.8	38.3	1.52	.58	1	31	W.	5	{S. E., {N. W.	8,101
Nov	28.714	28.678	28.707	28.700	29.103	5	28.163	26	.940	23.2	41.0	29.4	31.2	66.9	8	—12.8	23	79.7	45.4	19.6	.17	.10	22	30	N. W.	{25 {30	S.	5,407
Dec	28.714	28.701	28.746	28.720	29.262	24	28.169	3	1.093	4.4	14.5	6.9	8.6	53.8	2	—34.2	25	88.0	18.7	.7	.62	.18	23	31	S. E.	25	N. W.	6,671
Sums	343.579	343.237	343.530	343.448	......	...	......	...	11.256	405.7	589.8	474.1	489.9	.....	..	......	...	765.8	641.7	359.7	20.84	....	......	...	....	....	{N. W., {S. E.	84,705
Means	28.632	28.603	28.628	28.621	29.424	*4	27.751	†10	.938	33.8	49.2	39.5	40.8	95.9	‡2	—38.0	*4	63.8	53.5	30.0	.....	....	......	...	....	....	....	......

* January. † March. ‡ September.

HURON, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	18	1	2	11	12	5	7	35	2	−2.3	5.6	1.1	1.5	79.5	66.0	70.5	72.0	2.7	5.4	3.4	3.8	13	15	3	4	21	31	0	0	0
Feb	31	2	5	4	5	3	1	36	0	−4.4	2.8	−1.6	−1.1	79.2	68.4	76.1	74.6	4.6	6.9	4.7	5.4	8	9	12	12	20	29	0	0	0
Mar	25	15	5	21	8	0	2	16	1	16.7	22.3	20.0	19.7	84.6	69.9	80.3	78.3	5.7	5.7	4.7	5.4	7	16	8	10	10	28	0	0	0
Apr	21	13	9	19	6	3	3	16	0	30.6	33.5	34.8	33.0	84.3	58.6	78.2	73.7	5.6	5.9	5.1	5.5	9	9	12	11	1	16	0	1	1
May	18	11	7	25	8	4	4	16	0	42.6	43.3	45.4	43.8	83.7	48.3	71.2	67.7	4.1	5.1	2.6	3.9	14	12	5	12	0	1	0	2	0
June	9	6	5	37	27	2	0	3	1	57.6	62.2	60.9	60.2	87.8	58.5	77.9	74.7	3.4	4.9	3.2	3.8	14	13	3	8	0	0	2	7	0
July	10	17	8	25	5	6	2	18	2	57.0	59.8	59.5	58.8	89.9	59.2	81.9	77.0	4.6	5.8	3.8	4.7	8	17	6	18	0	0	0	13	0
Aug	7	2	1	37	18	2	3	23	0	54.1	59.5	58.1	57.2	89.1	57.2	80.2	75.5	4.1	4.9	3.2	4.1	12	17	2	6	0	0	0	2	0
Sept	16	9	3	27	12	4	8	8	3	47.1	49.5	49.7	48.8	86.2	49.3	76.7	70.7	4.7	4.7	2.0	3.8	12	15	3	8	0	0	2	8	3
Oct	17	2	4	20	19	5	5	20	1	35.4	37.5	38.8	37.2	78.6	47.7	70.7	65.7	4.5	4.3	2.8	3.9	15	10	6	7	0	12	0	0	0
Nov	22	4	4	5	24	3	4	21	3	18.3	28.4	23.0	23.2	80.9	62.3	76.8	73.3	3.5	4.5	3.0	3.7	17	7	6	5	4	29	0	0	0
Dec	20	3	0	14	10	4	5	33	4	−1.7	5.2	1.0	1.5	75.4	67.5	76.2	73.0	3.8	5.9	4.9	4.9	10	15	6	10	21	31	0	0	0
Sums	214	85	53	245	154	41	44	245	17	351.0	409.6	390.7	383.8	999.2	712.9	916.7	876.2	51.3	64.0	43.4	52.9	139	155	72	111	77	177	4	33	4
	Percentages.																					Percentages.								
Means	19.5	7.7	4.8	22.3	1.4	3.7	4.0	22.3	1.5	29.2	34.1	32.6	32.0	83.3	59.4	76.4	73.0	4.3	5.3	3.6	4.4	38	42.3	19.7	30.3	21	48.4	1.1	9	1.1

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.36 a. m., 1.36 p. m., and 9.36 p. m., local time.

Corrections for instrumental error of barometer used: From 5.36 a. m., January 1, to 9.36 p. m., December 16, inclusive, +.010 inch; from 5.36 a. m., December 17, to 9.36 p. m., December 31, 1884, inclusive, +.007.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.540; February, 1.520; March, 1.480; April, 1.450; May, 1.350; June, 1.340; July, 1.320; August, 1.340; September, 1.380; October, 1.430; November, 1.480; December, 1.540.

REMARKS.—January 10, electric storm; May 13, last frost; June 24, lightning from cloudless sky; July 21 and 25, destructive hail-storms; August 1, destructive hail-storm; August 28, tornado; September 11, first light frost; October 8, first killing frost; October 20, first snow.

SAM. W. GLENN,
Sergeant Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

INDIANAPOLIS, IND.

Location of office on December 31, 1884, Fletcher and Sharpe's Block, corner of Washington and Pennsylvania streets.

[Latitude, 39° 46′ N.; longitude, 86° 10′ W. Elevation of barometer above sea-level, 753 feet. Elevation of exposed thermometer above ground, 52 feet. Elevation of rain-gauge above ground, 74 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.345	29.318	29.352	29.338	29.856	26	28.778	1	1.078	18.4	25.8	20.7	21.6	56.8	30	—25.0	5	81.8	28.8	13.5	1.05	.87	18, 19	19	NW.	31	SW.	5,057
Feb	29.213	29.184	29.204	29.200	29.701	15	28.533	19	1.168	31.2	38.5	34.4	34.7	65.2	12	— 1.6	29	66.8	42.8	27.1	4.73	1.07	4, 5	32	NW.	19	NW.	4,636
Mar	29.202	29.172	29.196	29.190	29.589	30	28.607	25	.982	35.1	47.0	41.1	41.1	69.5	22	5.0	4	64.5	48.4	33.8	3.01	.85	11	24	W.	25	NW.	5,090
Apr	29.120	29.107	29.128	29.118	29.370	29	28.493	15	.877	44.8	56.0	49.8	50.2	80.5	30	31.4	8	49.1	58.5	42.6	2.39	.63	20	30	W.	27	SE., NW.	5,198
May	29.169	29.141	29.159	29.156	29.511	29	28.812	19	.699	56.9	68.6	60.8	62.1	84.0	22	40.6	29	43.4	71.0	53.8	4.80	1.24	18, 19	26	W.	2	SW.	4,275
June	29.235	29.199	29.224	29.219	29.445	16	28.807	9	.638	68.7	79.6	71.4	73.2	92.8	23	54.7	10	38.1	81.5	65.0	4.11	2.13	8, 9	18	W.	4	S.	3,530
July	29.149	29.124	29.141	29.138	29.373	21	28.971	4	.402	69.3	79.6	72.1	73.7	90.0	2	55.2	21	34.8	82.4	65.3	6.08	1.48	24, 25	24	NW., W.	26	NW.	3,390
Aug	29.276	29.234	29.252	29.254	29.503	9	28.919	29	.584	65.7	80.1	71.0	72.3	89.0	16 19	50.2	9	38.8	81.3	62.8	.46	.32	7	17	NW.	4 21	S.	3,357
Sept	29.280	29.240	29.267	29.262	29.554	14	28.962	28	.592	65.4	78.8	70.7	71.6	90.3	8	44.8	21	45.5	80.1	63.1	3.04	.83	27, 28	18	NW., W.	17 27	S.	3,664
Oct	29.366	29.323	29.339	29.343	29.659	15	29.044	8	.615	52.0	65.6	57.4	58.3	87.0	2	31.2	24	55.8	67.4	50.3	2.81	1.38	26, 27	17	NW.	22	S.	3,481
Nov	29.287	29.264	29.293	29.281	29.688	6	28.666	23	1.022	36.2	47.6	40.6	41.5	66.8	1	12.3	24	54.5	50.2	33.4	1.46	.49	28	24	W.	28	W.	4,065
Dec	29.300	29.281	29.306	29.296	29.785	19	28.544	6	1.241	27.5	33.0	29.2	29.9	60.7	5	—12.3	19	73.0	37.1	22.5	6.05	2.16	27, 28	20	SW., W.	7 22	SE.	4,829
Sums ..	350.942	350.587	350.861	350.795	....	....	....	....	9.898	571.2	700.2	619.2	630.2	......	......	....	....	646.1	729.5	533.2	39.99	....	......	...	....	....	....	50,567
Means .	29.245	29.216	29.238	29.233	29.856	*26	28.493	†15	.825	47.6	58.4	51.6	52.5	92.8	‡23	—25.0	*5	53.8	60.8	44.4	.....	....	......	...	....	....	S.	......

* January. † April. ‡ June.

INDIANAPOLIS, IND.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	12	7	5	2	16	19	17	14	1	11.1	12.8	12.7	12.2	72.7	58.0	71.0	67.2	6.4	5.6	4.3	5.4	6	16	9	12	17	28	0	0	0
Feb	8	5	18	6	17	11	5	20	2	24.8	28.4	27.9	26.9	75.4	66.6	77.4	73.1	7.1	8.4	6.7	7.4	4	9	16	18	5	18	0	3	0
Mar	10	9	12	18	15	6	7	20	1	26.9	28.5	29.9	28.4	71.9	52.1	66.8	63.4	6.5	7.4	6.9	6.9	3	14	14	16	7	13	0	3	0
Apr	12	11	8	16	9	4	12	16	2	33.7	35.3	36.4	35.1	66.1	49.5	61.6	59.1	7.1	7.5	6.0	6.9	5	8	17	17	0	2	0	3	0
May	8	12	4	7	11	22	9	17	3	47.1	46.6	49.1	47.6	71.0	48.3	66.8	62.0	5.6	5.8	3.6	5.0	10	13	8	15	0	0	0	10	0
June	8	11	14	17	19	6	8	6	11	59.0	59.8	60.4	59.7	71.7	53.0	69.0	64.6	6.0	7.2	4.3	5.8	8	12	10	9	0	0	4	9	0
July	16	8	2	2	6	17	14	20	8	60.0	58.8	61.5	60.1	72.9	50.6	70.1	64.5	5.5	6.3	4.5	5.4	8	14	9	16	0	0	0	9	0
Aug	16	11	5	1	19	12	9	14	6	56.7	55.6	57.9	56.7	73.0	43.8	63.8	60.2	3.3	5.5	2.1	3.6	17	12	2	7	0	0	0	7	0
Sept	8	7	4	9	35	14	3	9	7	56.7	55.9	57.2	56.6	74.2	48.9	63.9	62.3	5.7	5.2	3.9	4.9	7	16	7	11	0	0	1	10	0
Oct	5	14	7	8	19	15	8	10	7	47.4	47.7	49.4	48.2	84.5	54.2	75.1	71.3	4.3	4.4	2.7	3.8	13	14	4	9	0	1	0	3	1
Nov	6	5	5	6	16	17	19	10	6	32.7	35.6	35.5	34.6	87.6	63.8	82.2	77.9	4.5	4.5	3.7	4.2	13	10	7	8	1	8	0	0	0
Dec	7	8	6	26	7	12	14	18	0	24.7	26.8	25.8	25.8	89.8	78.4	87.8	85.2	8.0	7.7	6.5	7.4	5	6	20	22	10	21	0	0	0
Sums	106	108	85	118	189	155	119	169	54	480.8	491.8	503.7	491.9	910.8	667.2	854.5	810.8	70.0	75.5	55.2	66.7	99	144	123	160	40	91	5	57	1
	Percentages.																					Percentages.								
Means	9.7	9.8	7.7	10.8	17.2	14.1	10.8	15.4	4.9	40.0	41.0	42.0	41.0	75.9	55.6	71.2	67.6	5.8	6.3	4.6	5.6	27.1	39.8	33.6	43.7	10.9	24.9	1.4	15.6	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.24 a. m., 2.24 p. m., and 10.24 p. m., local time.

Correction for instrumental error of barometer used: From 6.24 a. m., January 1, to 10.24 p. m., December 31, 1884, inclusive, +.018 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.850; March, 0.840; April, 0.820; May, 0.790; June, 0.780; July, 0.770; August, 0.770; September, 0.780; October, 0.800; November, 0.840; December, 0.850.

REMARKS.—September 19, 2.30 p. m., slight earthquake; October 1, feeble aurora.

C. F. R. WAPPENHANS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

INDIANOLA, TEX.

Location of office on December 31, 1884, Schultz Building, corner Main and Crockett streets.

[Latitude, 28° 32′ N.; longitude 96° 31′ W. Elevation of barometer above sea-level, 26 feet. Elevation of exposed thermometer above ground, 29 feet. Elevation of rain-gauge above ground, 40 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.243	30.219	30.257	30.240	30.721	20	29.759	10	.962	42.3	51.2	46.6	46.7	73.7	31	18.0	5	55.7	55.1	37.8	.71	.30	15, 16	54	N.	1	N.	11,715
Feb	30.050	30.037	30.071	30.053	30.432	14	29.635	18	.797	57.0	65.3	58.3	60.2	79.0	22	28.0	14	51.0	68.2	52.7	.04	.03	16	52	N.	27	S.	10,858
Mar	29.980	29.953	29.975	29.969	30.344	9	29.671	24	.673	61.7	70.7	64.6	65.7	78.5	7, 27	33.2	1	45.3	72.5	59.2	1.91	1.49	17, 18	40	NE.	12	S.	10,787
Apr	29.921	29.912	29.930	29.921	30.262	23	29.546	14	.716	63.9	71.9	66.7	67.5	87.4	15	44.1	22	43.3	75.1	61.7	1.96	1.02	4, 5	56	N.	20	S.	12,257
May	29.922	29.926	29.949	29.932	30.184	9	29.699	21	.485	72.3	79.7	74.2	75.4	88.2	18	56.0	8	32.2	82.4	68.7	7.94	3.68	3, 4	43	N.	19	S.	9,848
June	29.931	29.938	29.934	29.934	30.094	28	29.786	3	.308	76.7	84.9	79.1	80.2	93.0	14	67.9	4	25.1	87.4	74.5	7.56	3.34	20, 21	35	NE.	4	S.	6,217
July	29.956	29.959	29.958	29.956	30.096	6	29.846	10	.250	79.7	89.6	81.1	83.5	98.0	10	76.2	10 13 21	21.8	91.9	78.4	.33	.33	18	36	S.	31	S.	8,798
Aug	29.981	29.981	29.988	29.983	30.113	3	29.859	30	.254	78.2	87.1	80.5	81.9	95.6	30	72.0	6	23.6	89.3	76.7	1.28	.68	22, 23	32	NE.	30	SE.	6,610
Sept	29.947	29.939	29.962	29.949	30.151	20	29.742	8	.409	78.0	84.9	80.0	81.0	90.3	24	69.2	28	21.1	86.6	76.4	9.60	6.00	27, 28	37	E.	28	E.	6,290
Oct	30.055	30.037	30.070	30.054	30.265	16	29.896	25	.369	70.7	77.6	73.7	74.0	86.0	1, 8	54.0	29	32.0	79.2	68.4	7.94	3.11	25, 26	39	N.	8	E.	8,878
Nov	30.127	30.102	30.141	30.123	30.458	7	29.710	22	.748	59.5	66.2	62.3	62.7	76.0	16 25	44.1	24	31.9	68.3	57.2	2.85	1.95	21, 22	40	NW.	27 28	E.	8,968
Dec	30.010	29.995	30.035	30.013	30.400	25	29.635	4	.765	51.0	57.9	53.1	54.0	76.6	4, 10	25.1	25	51.5	62.9	46.0	2.05	.60	29, 30	46	N.	18	N.	10,921
Sums	360.123	359.998	360.265	360.127	....	...	....	...	6.736	791.0	887.0	820.2	832.8	....	....	......	...	434.5	918.9	757.7	44.17	....	......	...	....	....	....	111,607
Means	30.010	30.000	30.022	30.011	30.721	*20	29.546	†14	.561	65.9	73.9	68.4	69.4	98.0	‡10	18.0	*5	36.2	76.6	63.1	.....	....	......	...	....	....	S.	....

*January. †April. ‡July.

INDIANOLA, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—							River.					
										Washington time.																								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan....	31	8	11	10	14	2	7	6	4	37.0	39.7	40.4	39.0	81.7	67.5	79.8	76.3	4.1	4.0	4.1	4.1	14	12	5	8	10	0	0	8 7	14	6 8	2	1 11	7 8.6
Feb....	17	8	7	18	28	2	0	7	0	53.1	54.1	52.6	53.3	87.8	69.9	83.5	80.2	5.4	5.4	3.6	4.8	9	14	6	2	2	0	0	9 0	17	7 4	14	1 8	8 2.4
Mar ...	14	9	19	16	29	4	0	2	0	56.9	58.5	60.3	58.6	85.7	67.5	86.7	80.0	7.0	5.5	5.1	5.9	8	13	10	5	0	0	1	10 5	14	7 9	1	2 8	9 4.9
Apr....	10	7	13	16	25	8	0	10	1	60.3	60.9	61.9	61.0	88.7	70.5	85.3	81.5	5.2	5.2	3.8	4.7	11	11	8	6	0	0	6	10 5	19	7 4	22	3 1	9 1.5
May . .	4	6	22	21	26	7	0	5	2	68.3	69.1	68.8	68.7	87.9	71.4	84.2	81.2	5.5	4.8	3.8	4.7	9	17	5	10	0	0	7	10 1	1	8 0	12, 18	2 1	9 1.0
June...	7	6	18	18	26	7	5	0	3	73.0	72.4	72.6	72.7	88.9	67.1	80.9	79.0	3.5	4.4	1.7	3.2	15	15	0	9	0	9	11	9 6	22	8 4	10–18	1 2	8 10.1
July...	0	1	6	12	50	20	0	0	4	76.6	75.8	76.4	76.3	90.6	64.2	86.0	80.3	2.7	3.2	0.7	2.2	24	7	0	1	0	26	2	9	17	8 0	29–31	1 0	8 5.8
Aug...	5	3	30	32	11	5	1	1	5	74.2	73.3	73.8	73.8	88.1	64.2	80.3	77.5	2.6	4.0	1.3	2.6	15	16	0	8	0	10	3	9 6	21	8 3	1, 2	1 3	8 11.5
Sept...	3	6	27	26	18	2	1	0	7	74.7	74.3	74.7	74.6	90.4	71.2	84.2	81.9	3.9	4.7	1.9	3.5	12	16	2	10	0	2	5	10 6	28	9 0	1, 2, 12–14, 21–23	1 6	9 3.3
Oct....	19	18	27	18	4	1	2	0	4	67.4	67.4	67.4	67.4	89.7	71.7	81.3	80.9	3.6	3.5	1.6	2.9	16	13	2	10	0	0	2	10 6	25	8 10	18	1 8	9 4.7
Nov ...	17	15	29	6	6	3	2	8	4	55.7	56.2	56.5	56.1	87.6	70.8	81.5	80.0	3.3	3.9	3.1	3.4	13	16	1	4	0	0	2	9 4	22	7 0	30	2 4	8 4.4
Dec....	32	4	14	1	15	9	3	8	7	48.5	50.2	50.0	49.6	91.1	78.3	89.6	86.3	6.1	6.0	4.6	5.6	7	17	7	17	3	0	1	9 2	28–30	6 11	2, 19	2 3	8 0.0
Sums.	159	91	223	194	252	70	21	47	41	745.7	751.9	755.4	751.1	1057.7	834.3	1003.3	965.1	52.9	54.6	35.3	47.6	1.53	1.67	46	90.	15	47	40	......	......	......	....	23 7	104 10.2
	Percentages.																					Percentages.												
Means	14.5	8.3	20.3	17.7	23.0	6.4	1.9	4.8	8.7	62.1	62.7	63.0	62.6	88.1	69.5	83.6	80.4	4.4	4.6	2.9	4.0	41.8	45.6	12.6	24.6	4.1	12.8	10.9	10 6	28 †25	6 8	‡2	1 10.6	8 8.8

* September. † October. ‡ January.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.42 a. m., 1.42 p. m., and 9.42 p. m., local time.

Corrections for instrumental error of barometer used: From 5.42 a. m., January 1, to 9.42 p. m., September 30, inclusive, — .024 inch; from 5.42 a. m., October 1, to 9.42 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

REMARKS.—Frosts, January, 3, 9; April 22; ice, January 1, 2, 3, 5, 6, 7, 8, 20, 21, 24, 25; February 13, 14, 15; March 1 in low places; December 18, 19, 25, 26, 31.

No maximum temperatures below 32°, and no auroras, during year.

ISAAC A. REED,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

KEOKUK, IOWA.

Location of office on December 31, 1884, State National Bank, corner of Second and Main streets.

[Latitude, 40° 22′ N.; longitude, 91° 26′ W. Elevation of barometer above sea-level, 618 feet. Elevation of exposed thermometer above ground, 47 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.537	29.527	29.540	29.535	30.053	5	28.954	10	1.099	15.0	22.7	18.4	18.7	52.5	30	—24.2	5	76.7	27.4	10.5	.85	.53	1	20	NW.	2, 23	NW.	4,403
Feb	29.382	29.355	29.371	29.369	29.750	9	28.783	19	.967	23.8	31.5	27.8	27.5	51.8	26	2.0	28	49.8	36.3	19.4	1.88	.89	12	24	SE., NW.	18, 21	NW.	4,554
Mar	29.344	39.325	29.354	29.341	29.744	3	28.633	11	1.111	32.1	43.2	36.6	37.3	66.5	27	2.5	4	64.0	45.3	29.1	3.37	1.95	25	44	SE.	27	N.	5,405
Apr	29.289	29.261	29 272	29.274	29.589	20	28.736	1	.853	44.2	57.3	50.4	50.6	80.4	30	28.2	8	52.2	59.6	41.9	1.31	.34	1	30	SE., SW., W.	26, 27	W.	5,981
May	29.309	29.282	29.290	29.294	29.678	29	28.934	1	.744	56.5	69.6	60.8	62.3	80.2	22	40.0	2	40.2	71.6	52.1	3.16	.85	5, 6	18	NW., SE.	1, 5	E., W.	2,886
June	29.354	29.331	29.330	29.338	29.553	28	29.043	9	.510	66.7	78.6	69.3	71.5	91.0	23	51.0	10	40.0	80.0	61.7	4.03	1.52	1, 2	19	W.	8	E.	2,062
July	29.291	29.267	29.264	29.274	29.517	20	29.029	4	.488	69.6	81.7	73.5	74.9	93.3	23	59.0	6	34.3	83.9	65.1	2.30	.81	21	30	SW.	21	N.	4,780
Aug	29.399	29.377	29.368	29.381	29.710	9	29.079	29	.631	65.6	80.0	70.4	72.0	89.8	20	49.8	8	40.0	81.7	61.6	2.74	1.17	27, 28	29	SE.	25	S.	5,111
Sept	29.362	29.326	29.327	29.338	29.676	20	28.930	23	.746	64.2	79.4	69.6	71.1	90.4	9	50.2	25	40.2	80.2	61.8	4.25	1.37	6, 7	38	SE.	19	S.	6,378
Oct	29.482	29.444	29.460	29.462	29.809	23	29.172	26	.637	52.3	66.3	56.8	58.5	86.2	4	28.7	23	57.5	68.3	49.7	3.35	1.15	20, 21	23	SE.	26	S.	5,426
Nov	29.436	29.419	29.434	29.430	29.825	6	28.812	22	1.013	35.4	47.1	39.3	40.6	67.6	9	12.6	24	55.0	50.1	32.3	1.73	1.16	22, 23	26	NW.	28	NW.	5,051
Dec	29.457	29.433	29.452	29.447	29.903	18	28.741	6	1.252	20.2	26.4	22.5	23.0	58.7	4	—12.7	19	71.4	30.3	17.2	3.91	1.35	30	24	NW., W.	22, 31	NW.	5,215
Sums	352.642	352.347	352.462	352.483	....	...	....	...	10.051	545.1	683.8	595.4	608.0	....	...	....	...	621.8	714.7	502.4	32.88	....	....	...	....	....	....	57,252
Means	29.387	29.362	29.372	29.374	30.053	*5	28.633	†11	.838	45.4	57.0	49.6	50.7	93.3	‡23	—24.2	*5	51.8	59.6	41.9	.....	....	....	...	....	....	NW.	......

*January. † March. ‡ July.

KEOKUK, IOWA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.									
										Washington time.																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																		Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan ...	9	4	1	6	10	16	11	24	12	*10.5	*15.6	*12.9	*13.0	*77.8	*70.9	*74.8	74.5	3.7	4.6	4.2	4.2	11	15	5	9	16	27	0	0	0	Frozen.									
Feb....	4	11	4	10	5	8	6	26	13	18.2	23.7	22.3	21.4	80.2	73.5	80.4	78.0	6.2	6.2	4.4	5.6	6	15	8	9	7	26	0	0	0										
Mar ...	17	7	10	13	10	7	7	14	8	26.5	31.5	29.6	29.2	79.7	65.7	76.3	73.9	4.9	6.5	5.1	5.5	7	17	7	14	7	15	0	2	0	†16	8	30 31	7	9	20	8	11	12	3.6
Apr ...	7	9	10	12	6	5	13	10	18	37.3	37.9	40.3	38.5	77.1	51.6	69.3	66.0	5.4	6.2	6.2	5.9	5	15	10	11	0	2	0	2	0	16	7	1	8	10	29 30	7	9	12	0.2
May ...	7	5	12	10	11	5	12	7	24	48.2	48.6	50.9	49.2	74.4	50.1	71.2	65.2	4.0	4.4	4.5	4.3	10	17	4	9	0	0	0	6	0	10	4	8 9	7	9	31	2	7	9	3.4
June...	7	13	14	10	10	3	2	0	31	61.7	63.5	63.3	62.8	84.8	60.3	81.5	75.4	4.8	6.2	3.1	4.7	9	15	6	14	0	0	1	7	0	7	11	10	6	6	30	1	5	7	2.7
July...	19	6	11	10	13	12	6	13	3	62.5	64.9	65.0	64.1	78.4	58.9	75.3	70.9	4.3	5.1	2.9	4.1	12	16	3	11	0	0	4	7	0	6	4	1	3	4	25	3	0	4	10.5
Aug ...	7	8	7	14	17	12	10	10	8	59.3	59.6	61.4	60.1	80.5	51.0	73.9	68.5	2.5	5.2	1.6	3.1	18	11	2	9	0	0	0	6	0	5	0	29	2	7	20	2	5	3	4.7
Sept ...	5	3	12	17	33	6	7	4	3	58.7	60.8	61.4	60.3	82.9	54.5	76.2	71.2	3.5	3.6	2.8	3.3	17	9	4	11	0	0	2	8	1	10	4	30	2	9	5 6	7	7	4	10.4
Oct	5	4	7	14	18	15	14	9	7	48.1	48.5	49.0	48.5	83.7	55.2	75.9	72.3	3.1	3.5	2.7	3.1	18	9	4	10	0	1	0	3	0	13	4	9	8	10	31	4	6	11	3.0
Nov ...	9	8	6	10	7	19	3	24	4	31.1	34.2	33.4	32.9	84.8	62.4	79.7	75.5	3.8	4.0	3.8	3.9	12	12	6	5	1	13	0	0	0	8	5	1	4	1	30	4	4	6	1.7
Dec....	16	2	14	11	7	3	16	18	6	16.7	19.8	18.4	18.3	85.6	76.7	83.9	82.0	7.4	6.3	6.4	6.7	4	13	14	15	14	22	0	0	0	10	6	31	2	4	4	8	2	4	2.7
Sums .	112	80	108	137	147	111	107	159	137	478.8	508.6	507.9	498.3	970.9	730.8	918.4	873.4	53.6	61.8	47.7	54.4	129	164	73	127	45	106	7	41	1	......		....	......		...	......		......	
	Percentages.																					Percentages.																		
Means.	10.2	7.3	9.8	12.5	13.4	10.1	9.7	14.5	12.5	39.9	42.4	42.3	41.5	80.9	60.9	76.5	72.8	4.5	5.2	4.0	4.6	35.2	44.8	19.9	34.7	12.3	29.0	1.9	11.2	0.3	......		....	......		....	......		......	

*30 days. †11 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.02 a. m., 2.02 p. m., and 10.02 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.025 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.690; April, 0.670; May, 0.650; June, 0.640; July, 0.630; August, 0.630; September, 0.650; October, 0.670; November, 0.690; December, 0.710.

REMARKS.—January, unusually cold, 2–8; March, navigation opened, 24; flood began, 27; April, flood ended, 8; last snow-storm, 7–8; last frost, 24; August, drought until 16; September, light frost in vicinity, 25; October, first light frost at station, 9; first killing frost, 23; November, first light snow, 17; first regular snow-storm, 29; ice running in river, 28–30; December, navigation closed, 12; river frozen, 20.

FRED. Z. GOSEWISCH, *Sergeant, Signal Corps, U. S. A.*

Meteorological summary for the year ending December 31, 1884—Continued.

KEY WEST, FLA.

Location of office on December 31, 1884, Wall & Co.'s building, Front street, between Duval and Fitzpatrick streets.

[Latitude, 24° 34′ N.; longitude, 81° 49′ W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 42 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p.m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.166	30.128	30.180	30.158	30.425	21	29.905	8	.520	66.4	71.2	67.3	68.3	81.0	1 12	51.0	22	30.0	73.4	64.2	1.82	1.13	7, 8	36	N.	2 21	NE.	9,343
Feb	30.112	30.086	30.126	30.108	30.234	9	29.889	28	.345	70.5	75.9	71.0	72.5	83.0	14	60.2	29	22.8	78.2	69.0	1.70	.60	13, 22, 23	25	N.	29	E.	6,079
Mar	30.092	30.066	30.106	30.088	30.308	4	29.925	27	.383	72.3	78.6	72.8	74.6	85.9	9	58.0	1	27.9	80.8	70.1	.16	.08	14, 15	32	NW.	14	SE.	7,919
Apr.*	30.017	29.989	30.027	30.011	30.170	29	29.702	6	.468	74.8	79.9	73.9	76.2	88.8	21	65.8	11	23.0	82.0	71.7	.98	.68	22, 23	36	SW.	6	SE.	7,311
May	30.009	29.979	30.015	30.001	30.145	2	29.830	30	.315	80.3	84.8	77.7	80.9	90.7	20	70.8	12	19.9	87.4	75.2	.35	.23	28, 29	26	NE.	30	E.	5,897
June	29.990	29.974	30.012	29.992	30.124	27	29.849	21	.275	80.9	85.7	78.6	81.7	91.9	8	72.5	21 22	19.4	87.9	75.9	4.56	1.93	20, 21	28	SE.	21	SE.	6,457
July	30.024	30.019	30.050	30.031	30.128	27	29.854	8	.274	83.9	89.1	81.9	85.0	94.1	30	75.8	8	18.3	91.3	79.5	2.36	1.37	20, 21	23	SE.	11	SE.	5,491
Aug	30.000	29.975	30.021	29.999	30.100	2	29.860	29	.240	82.1	88.4	81.1	83.9	94.7	1	72.0	20	22.7	91.1	78.4	3.16	1.36	3, 4	31	NE.	19	E.	5,366
Sept	30.003	29.971	30.020	29.998	30.147	19	29.871	7	.276	80.6	85.6	80.5	82.2	91.6	1	73.3	24	18.3	87.7	77.3	7.08	2.43	9	32	SW.	17	E.	6,337
Oct	29.985	29.948	30.000	29.978	30.157	25	29.776	14	.381	76.6	81.0	77.3	78.3	86.6	1	70.3	16	16.3	81.9	74.7	3.17	1.06	5	28	N., NE.	15	NE.	10,614
Nov.†	30.032	29.994	30.046	30.024	30.124	24	29.904	7	.220	73.4	77.0	74.2	74.9	82.9	3	69.3	26	13.6	78.0	72.0	6.03	3.51	4	26	NW.	8	NE.	7,720
Dec	30.092	30.056	30.109	30.086	30.196	29	29.908	5	.288	71.1	75.8	72.1	73.0	82.2	6	62.0	2	20.2	77.7	70.0	1.68	.71	21, 22	28	NE.	3	NE.	7,238
Sums	360.522	360.185	360.712	360.474	....	...	....	...	3.985	912.9	973.0	908.4	931.5	....	....	....	..	252.4	997.4	878.0	33.05	....	......	...	....	....	....	85,772
Means	30.044	30.015	30.059	30.039	30.425	‡21	29.702	§6	.332	76.1	81.1	75.7	77.6	94.7	‖1	51.0	‡22	21.0	83.1	73.2	.....	....	......	...	....	....	NE.	......

* One 7 a. m. observation missed.

† One 11 p. m. observation missed.

‡ January.

§ April.

‖ August.

KEY WEST, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	17	35	14	15	5	3	1	3	0	61.1	61.6	61.2	61.3	83.5	72.3	81.4	79.1	4.5	3.8	4.2	4.2	12	14	5	12	0	0	0	0	0
Feb	12	12	23	17	7	6	3	7	0	64.3	63.9	64.2	64.1	81.2	66.8	79.3	75.8	3.0	3.0	3.1	3.0	17	9	3	9	0	0	0	2	0
Mar	7	11	24	25	5	8	3	10	0	65.2	64.6	66.0	65.3	79.0	62.8	79.8	73.9	3.2	2.5	1.8	2.5	20	10	1	4	0	0	0	0	0
Apr*	14	13	11	27	7	3	4	8	2	65.1	64.2	64.8	64.7	72.4	59.5	73.4	68.4	2.4	2.3	1.1	1.9	22	7	0	2	0	0	0	1	0
May	8	9	21	19	8	14	2	12	0	70.4	69.6	69.1	69.7	72.2	61.5	75.2	69.6	4.2	3.7	2.1	3.3	12	19	0	4	0	0	7	5	0
June	1	12	22	24	23	6	1	1	0	72.8	72.3	72.4	72.5	76.6	64.7	81.2	74.2	5.6	6.1	3.7	5.1	6	20	4	11	0	0	8	7	0
July	4	9	12	29	8	14	8	9	0	74.7	74.2	74.3	74.4	74.0	61.8	77.8	71.2	4.6	4.3	3.0	4.0	12	17	2	8	0	0	23	5	0
Aug	0	16	27	23	11	6	5	5	0	74.4	74.1	73.7	74.1	77.6	63.0	78.2	72.9	5.7	5.8	5.0	5.5	1	28	2	15	0	0	24	12	0
Sept	1	23	34	9	4	6	4	7	2	74.5	74.0	74.0	74.2	82.0	68.7	81.0	77.2	6.2	6.7	4.1	5.7	1	26	3	21	0	0	6	9	0
Oct	9	64	15	0	0	0	0	5	0	70.5	70.0	70.5	70.3	82.1	69.7	80.1	77.3	4.4	5.1	3.4	4.3	9	19	3	15	0	0	0	0	0
Nov‡	16	44	13	8	5	1	2	0	0	69.9	70.1	70.3	70.1	89.3	79.7	88.0	85.7	6.9	7.0	4.5	6.1	2	21	6	17	0	0	0	2	0
Dec	11	34	24	14	6	1	1	2	0	67.2	67.4	67.3	67.3	87.7	75.9	85.1	82.9	4.9	4.6	3.2	4.2	11	17	3	11	0	0	0	0	0
Sums	100	282	240	210	89	68	34	69	4	830.1	826.0	827.8	828.0	957.6	806.4	960.5	908.2	55.6	54.9	39.2	49.8	125	207	32	129	0	0	68	43	0
	Percentages.																					Percentages.								
Means	9.1	25.7	21.9	19.2	8.1	6.2	3.1	6.3	.4	69.2	68.8	69.0	69.0	79.8	67.2	80.0	75.7	4.6	4.6	3.3	4.2	34.3	56.9	8.8	†35.2	0	0	†18.6	†11.7	0

* One 7 a. m. observation missed.

‡ One 11 p. m. observation missed.

† Percentages of 366 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, .000 inch.

The barometric observations may be be reduced to sea-level by adding the following constants for the various months; January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

REMARKS.—Barometer No. 235 used during the year. June 12, nine water-spouts visible at the same time. August 22, three water-spouts visible at the same time. No frost during the year. No snow fell during the year.

JAMES HARVEY SMITH,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

KITTY HAWK, N. C.

Location of office on December 31, 1884, Life-Saving Station No. 12.

[Latitude, 36° N.; longitude, 75° 42′ W. Elevation of barometer above sea-level, 9 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.198	30.153	30.191	30.181	30.783	27	29.368	8	1.415	36.7	41.1	37.4	38.4	65.0	24	8.6	6	56.4	45.8	31.2	6.50	1.95	18, 19	64	SE.	8	NE.	12,7`6
Feb. *	30.110	30.097	30.130	30.112	30.628	16	29.332	28	1.296	48.1	53.3	47.8	49.7	71.1	6	21.1	29	50.0	58.8	41.3	4.32	.94	20	56	SW.	23	SW.	10,362
Mar	30.056	29.997	30.058	30.037	30.412	16	29.527	29	.885	46.4	53.9	47.7	49.3	71.0	26	21.5	5	49.5	57.1	41.3	9.17	1.67	26	47	N.	30	NE.	10,924
Apr	29.914	29.872	29.910	29.899	30.253	12	29.232	2	1.021	50.1	54.9	50.1	51.7	73.0	16	38.0	7	35.0	58.2	45.8	4.83	1.72	15	48	NE.	22	NE.	10,288
May	30.006	29.969	29.995	29.990	30.324	3	29.714	11	.610	63.3	71.1	63.1	65.8	89.0	24	42.5	1	46.5	74.2	58.0	1.75	.46	27, 28	37	NE.	12	SW.	9,272
June.....	30.081	30.050	30.058	30.063	30.333	16	29.643	10	.690	69.2	75.0	69.2	71.1	91.0	23	52.0	17	39.0	77.6	64.5	4.57	2.12	14	40	NE.	15	SW.	10,293
July	29.937	29.908	29.929	29.925	30.136	22	29.783	{13 14}	.403	75.1	81.5	74.5	77.0	96.7	25	61.5	21	35.2	84.0	70.1	10.76	2.87	11, 12	34	SW.	29	SW.	10,004
Aug	30.054	30.037	30.051	30.047	30.238	25	29.688	31	.550	74.0	78.8	74.0	75.6	92.7	30	68.0	14	24.7	80.9	71.2	6.58	1.93	7	36	NE.	12	NE.	10,441
Sept	30.145	30.114	30.136	30.132	30.316	14	29.800	17	.516	72.6	80.1	72.6	75.1	88.3	8	61.7	6	26.6	81.2	60.8	.15	.07	24	50	NE.	13	NE.	9,872
Oct	30.171	30.131	30.155	30.152	30.557	26	29.854	18	.703	63.6	71.9	64.8	66.8	86.0	4, 5	42.1	25	43.9	73.8	59.8	1.23	1.04	30, 31	47	NE.	15	NE.	10,278
Nov	30.120	30.080	30.098	30.099	30.435	22	29.470	28	.965	52.2	58.6	55.0	55.3	69.8	23	34.9	25	34.9	61.2	48.6	7.14	4.04	16	48	NW.	16	NE.	10,171
Dec......	30.193	30.150	30.174	30.172	30.567	20	29.734	6	.833	45.9	50.8	48.8	48.5	69.8	31	14.7	19	55.1	55.1	41.2	5.65	1.39	21, 22	60	N.	18	N.	12,772
Sums ..	360.985	360.558	360.885	360.809	....	...	....	...	9.887	697.2	771.0	705.0	724.3	....	....	......	..	496.8	807.9	642.3	62.65	.....	......	...	....	....	....	126,908
Means	30.082	30.046	30.074	30.067	30.783	†27	29.232	‡2	.824	58.1	64.2	58.8	60.4	96.7	§25	8.6	†6	41.4	67.3	53.5	.....	.....	......	...	....	....	NE.	....

* One 7 a. m., one 11 p. m., and one 3 p. m., observation not taken.

† January.

‡ April.

§ July.

KITTY HAWK, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	24	1	3	6	18	9	21	1	31.5	32.5	32.0	32.0	81.4	72.9	81.3	78.5	6.5	6.2	4.9	5.9	7	12	12	18	2	14	0	0	0
Feb	5	21	7	4	5	30	2	9	4	44.1	43.3	42.2	43.2	86.2	71.1	81.8	79.7	5.9	5.0	4.2	5.0	6	15	8	15	1	3	0	0	0
Mar	10	18	9	11	6	16	14	9	0	40.1	42.2	41.5	41.3	79.9	68.2	80.4	76.2	4.1	4.9	3.7	4.2	12	14	5	17	0	4	0	4	0
Apr	7	32	12	7	4	8	4	15	1	43.0	42.1	42.4	42.5	78.1	65.1	77.2	73.5	4.1	5.1	3.1	4.1	13	13	4	12	0	0	0	0	0
May	4	21	21	13	5	25	4	0	0	56.3	56.6	57.1	56.7	78.9	62.5	81.6	74.3	4.4	3.6	2.5	3.5	16	12	3	9	0	0	0	2	0
June	1	26	4	15	5	30	4	5	0	63.6	65.6	65.0	64.7	83.4	74.2	87.1	81.6	4.4	4.9	3.8	4.4	11	12	7	7	0	0	1	1	0
July	5	9	8	10	5	37	15	4	0	69.7	69.2	70.2	69.7	83.7	68.3	87.0	79.7	5.3	4.6	3.7	4.5	10	14	7	17	0	0	5	4	0
Aug	1	28	17	6	8	25	5	1	2	70.4	70.5	70.7	70.5	89.0	77.0	89.9	85.3	5.9	7.2	5.2	6.1	6	12	13	12	0	0	2	1	0
Sept	2	23	14	12	16	15	6	1	1	67.5	67.3	67.3	67.4	85.0	67.8	84.0	78.9	3.9	3.4	1.6	3.0	16	12	2	3	0	0	0	0	0
Oct	7	29	11	11	6	13	8	8	0	58.1	58.7	58.1	58.3	83.2	65.2	80.2	76.2	4.4	3.8	2.0	3.4	18	16	2	4	0	0	0	0	0
Nov	8	29	5	2	6	9	16	15	0	47.4	47.3	47.6	47.4	84.7	68.9	77.1	76.9	5.2	5.2	4.1	4.8	11	9	10	9	0	0	0	0	0
Dec	26	14	1	3	7	18	14	10	0	41.0	42.6	42.9	42.2	83.9	75.2	80.8	80.0	6.7	7.0	6.1	6.6	5	8	18	16	1	3	0	1	0
Sums ..	86	274	110	97	79	244	101	98	9	632.7	637.9	637.0	635.9	997.4	836.4	988.4	910.8	60.8	60.9	44.9	55.5	126	149	91	139	4	24	8	13	0
	Percentages.																					Percentages.								
Means .	7.8	25.0	10.0	8.8	7.2	22.2	9.2	8.9	.8	52.7	53.2	53.1	53.0	83.1	69.7	82.4	78.4	5.1	5.1	3.7	4.6	34.4	40.7	24.9	38.0	1.1	6.6	2.2	3.6	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.05 a m., 3.05 p. m., and 11.05 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., March 18, inclusive, +.009 inch; from 7 a. m., March 19, to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010: February, 0.010; March, 0.010; April, 0 010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0,010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—Elevation of exposed wet bulb and maximum thermometer increased 1 foot, and minimum thermometer and rain-gauge increased 0.5 feet October 28. Elevation of barometer decreased 13 feet after 11 p. m. observation of October 31, in consequence of removal of office. Change of correction for instrumental error of barometer due to a change of instruments.

P. H. FITZMAURICE,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

KNOXVILLE, TENN.

Location of office on December 31, 1884, Custom-house building, corner of Prince and Church streets.

[Latitude, 35° 56′ N.; longitude 83° 58′ W. Elevation of barometer above sea-level, 980 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 3-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.186	29.146	29.175	29.169	29.597	26	28.687	8	.910	25.5	34.6	29.4	29.8	60.4	30	−16.0	6	76.4	39.7	21.2	6.66	1.42	31	24	W., SW.	2 30	W.	4,989
Feb	29.076	29.032	29.046	29.051	29.407	15	28.565	19	.842	41.4	52.3	46.1	46.6	74.3	12	7.5	29	66.8	55.9	39.0	8.51	2.06	8, 9	36	W.	20	SW.	4,725
Mar	29.022	28.994	29.008	29.008	29.374	9	28.571	1	.803	42.8	55.3	49.1	49.1	75.7	28	14.0	1	61.7	59.1	40.2	11.93	2.97	5	33	W.	25	SW.	4,963
Apr	28.942	28.902	28.935	28.926	29.167	29	28.474	2	.693	48.6	62.8	54.0	55.1	86.0	30	30.7	9	55.3	65.1	45.7	4.44	1.81	14, 15	48	SE.	14	NE.	4,785
May	28.996	28.950	28.979	28.975	29.220	31	28.734	6	.486	59.9	75.8	64.6	66.8	89.0	22	45.8	17	43.2	77.8	56.3	2.19	.77	4, 5	28	SW.	19	W.	4,492
June	29.039	28.989	29.010	29.013	29.267	16	28.690	10	.577	66.1	79.5	69.7	71.8	92.1	21	53.1	1	39.0	82.7	64.0	5.83	1.58	6, 7	30	S.	23	NE.	3,087
July	28.981	28.942	28.964	28.962	29.150	21	28.797	10	.353	69.6	82.5	72.4	74.8	91.2	24	59.5	8 21	31.7	85.1	66.8	8.59	3.14	31	44	W.	5	SW.	3,520
Aug	29.090	29.039	29.064	29.064	29.222	19	28.838	29	.384	66.4	82.5	70.6	73.2	93.2	27	56.9	6	36.3	84.9	64.5	4.75	1.60	28, 29	28	N.	22	NE.	2,803
Sept	29.135	29.074	29.106	29.105	29.316	14 15	28.949	23	.367	64.2	83.2	69.7	72.4	92.2	8	49.9	19	42.3	84.7	62.7	.66	.63	17	18	N., SW.	12 24	NE.	2,856
Oct	29.178	29.118	29.151	29.149	29.452	20	28.897	8	.555	56.0	76.3	61.7	64.7	94.0	3	29.0	24	65.0	77.6	54.2	2.05	.92	28	19	SW.	27	NE.	2,750
Nov	29.183	29.080	29.117	29.110	29.437	6	28.520	28	.917	38.2	56.8	43.8	46.3	71.8	2	25.8	25	46.0	58.4	35.8	1.81	.39	23	28	SW.	23	NE.	2,711
Dec	29.129	29.085	29.128	29.114	29.411	8	28.531	6	.880	34.8	47.1	38.6	40.2	69.5	29	5.2	19	64.3	49.3	31.7	6.11	1.90	21	36	SW.	6	NE.	4,107
Sums ..	348.907	348.851	348.683	348.646	......	...	......	...	7.767	613.5	788.7	669.7	690.8	....	....	......	...	628.0	820.3	582.1	62.53	....	......	...	....	....	....	45,788
Means .	29.077	29.029	29.057	29.054	29.597	*26	28.474	†2	.647	51.1	65.7	55.8	57.5	94.0	‡3	−16.0	*6	52.3	68.4	48.5	......	....	......	...	....	....	NE.	......

*January. †April. ‡October.

KNOXVILLE, TENN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	14	21	8	3	2	16	22	8	4	22.0	24.1	24.6	23.6	86.8	67.2	82.6	78.9	6.5	6.7	5.8	6.3	6	11	14	14	8	23	0	0	0
Feb	6	14	10	0	6	26	11	7	7	37.2	36.4	40.1	37.9	85.5	58.9	80.4	74.9	5.9	6.4	5.6	6.0	7	9	13	17	1	9	0	2	0
Mar	9	21	9	8	2	22	16	3	8	37.4	38.1	40.8	38.8	82.2	57.5	75.2	71.6	6.4	7.3	5.4	6.4	6	13	12	16	0	9	0	5	0
Apr	6	20	2	1	8	19	18	9	7	42.1	40.0	43.1	41.7	80.2	48.7	68.9	65.9	5.3	6.2	5.1	5.5	9	11	10	15	0	1	0	6	0
May	16	18	19	0	2	17	19	5	7	54.8	51.9	54.5	53.7	84.0	45.9	70.4	66.8	3.7	4.6	3.2	3.8	11	18	2	12	0	0	0	7	0
June	13	23	8	7	7	14	8	5	5	62.4	60.8	64.1	62.4	88.2	55.8	83.2	75.7	6.3	6.7	5.4	6.1	3	17	10	18	0	0	4	14	0
July	8	14	1	0	7	33	14	4	12	66.6	64.3	67.5	66.1	90.5	56.6	85.4	77.5	4.6	5.7	3.3	4.5	9	16	6	16	0	0	3	11	0
Aug	13	25	5	8	2	14	9	5	12	63.5	61.3	64.8	63.2	90.5	50.2	81.3	74.0	4.2	4.9	3.0	4.0	14	13	4	9	0	0	2	7	0
Sept	11	32	9	3	5	13	5	1	11	60.7	58.0	63.2	60.6	88.7	44.3	80.5	71.2	3.7	4.1	2.9	3.6	12	16	2	3	0	0	3	2	0
Oct	18	20	3	10	4	7	9	8	19	52.7	50.0	53.3	52.0	89.0	43.2	74.8	69.0	2.4	3.6	1.9	2.6	23	3	5	5	0	1	7	1	0
Nov	9	19	7	6	5	9	8	5	22	35.0	35.0	37.3	35.8	88.3	47.2	78.3	71.3	3.4	3.9	3.0	3.4	18	7	5	6	0	7	0	0	0
Dec	15	18	13	3	3	11	15	5	10	31.2	33.4	32.3	32.3	86.6	61.4	78.4	75.5	6.7	6.5	5.4	6.2	6	13	12	12	2	14	0	1	0
Sums	138	245	79	44	53	201	154	60	124	565.6	553.3	585.6	568.1	1040.5	636.9	939.4	872.8	59.1	66.6	50.0	58.4	124	147	95	143	11	64	19	56	0
	Percentages.																					Percentages.								
Means	12.6	22.3	7.2	4.0	4.8	18.3	14.0	5.5	11.3	47.1	46.1	48.8	47.3	86.7	53.1	78.3	72.7	4.9	5.6	4.2	4.9	33.9	40.2	26.0	39.1	3.0	17.5	5.2	15.3	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.32 a. m., 2.32 p. m., and 10.32 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.023 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.080; February, 1.080; March, 1.060; April, 1.040; May, 1.020; June, 1.010; July, 1.000; August, 1.010; September, 1.020; October, 1.040; November, 1.070; December, 1.080.

REMARKS.—Destructive hail-storm March 25. Earthquake shock August 24.

JNO. A. CODY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LA CROSSE, WIS.

Location of office on December 31, 1884, Opera House.

[Latitude, 43° 49′ N.; longitude, 91° 15′ W. Elevation of barometer above sea-level, 725 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 67 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.362	29.343	29.357	29.354	29.819	5	28.610	13	1.209	6.6	15.9	11.7	11.4	45.0	29	−29.0	5	74.0	20.0	1.9	.58	.24	27	25	N.	{18 {23	S.	6,259
Feb	29.247	29.229	29.235	29.237	29.707	10	28.698	19	1.009	12.4	22.2	19.1	17.9	43.0	{18 {19	−10.0	15	53.0	26.0	8.7	1.42	.35	4, 5	25	N.	27	S.	5,689
Mar	29.221	29.208	29.223	29.217	29.599	14	28.268	11	1.331	23.5	34.9	30.1	29.5	66.0	27	−10.0	4	76.0	36.4	21.1	1.11	.42	22	30	SE.	10	S.	5,524
Apr*	29.183	29.143	29.167	29.164	29.746	21	28.535	27	1.211	40.8	52.0	46.6	46.5	75.0	30	27.5	7	47.5	54.5	38.2	3.07	.38	1	33	N.	15	N.	6,687
May	29.164	29.130	29.134	29.143	29.624	29	28.800	18	.824	54.8	66.2	60.1	60.4	79.3	17	38.0	2	41.3	67.6	52.2	1.82	.33	6	29	NW.	1	S.	5,807
June	29.255	29.221	29.227	29.234	29.547	14	28.960	8	.587	65.8	76.7	68.8	70.4	88.0	30	51.4	10	36.6	78.1	62.4	2.94	1.37	21	40	N.	30	S.	4,093
July	29.151	29.129	29.120	29.133	29.438	20	28.835	4	.603	65.8	75.2	68.6	69.9	91.0	22	55.0	6	36.0	76.5	62.2	4.58	1.09	3	63	N.	25	S.	4,211
Aug	29.238	29.207	29.208	29.218	29.583	9	28.895	29	.688	62.7	75.2	67.8	68.6	86.2	15	52.0	4	34.2	76.6	61.1	3.82	2.17	2	28	S.	24	S.	5,166
Sept	29.190	29.143	29.164	29.166	29.596	12	28.684	23	.912	60.8	73.0	65.9	66.8	88.0	8	49.5	20	38.5	74.7	59.3	10.01	5.69	6, 7	26	N.	26	S.	5,599
Oct	29.293	29.250	29.281	29.275	29.724	14	28.837	5	.887	49.5	59.4	53.3	54.1	84.0	3	26.0	23	58.0	61.4	46.8	2.31	.57	1	31	S.	5	S.	6,508
Nov	29.296	29.268	29.291	29.285	29.604	6	28.821	22	.783	28.9	39.4	33.8	34.0	62.0	9	− 4.0	24	66.0	42.4	26.8	1.45	.92	22, 23	32	N.	28	S.	5.074
Dec	29.308	29.289	29.308	29.302	29.934	25	28.664	6	1.270	14.1	20.2	17.2	17.2	46.0	4	−26.0	25	72.0	23.9	11.1	2.25	.39	30, 31	28	NW.	8	N.	5,225
Sums ..	350.908	350.560	350.715	350.728	......	...	....	..	11.314	485.7	610.9	543.0	546.7	..	....	......	...	633.1	638.1	451.8	35.31	....	......	...	....	....	....	65,842
Means .	29.242	29.213	29.226	29.227	29.934	†25	28.268	‡11	.943	40.5	50.9	45.2	45.5	91.0	§22	−29.0	‖5	52.8	53.2	37.6	.....	....	......	...	....	....	S.	......

* One 11 p. m. observation taken late. † December. ‡ March. § July. ‖ January.

LA CROSSE, WIS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.					
										Washington time.																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																		Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan	16	2	0	4	23	11	21	16	0	1.1	7.1	4.6	4.8	78.7	68.1	72.8	73.2	5.2	4.2	4.2	4.5	9	15	7	9	23	31	0	0	0	Frozen.					
Feb	21	10	0	2	22	5	9	17	1	6.2	14.7	12.1	11.0	75.6	72.3	74.4	74.1	7.0	7.0	6.9	7.0	1	13	15	18	21	28	0	0	0	Frozen.					
Mar ...	19	9	3	6	20	10	8	18	0	15.9	23.3	21.7	20.3	72.6	66.0	71.6	70.1	6.1	5.9	4.7	5.6	9	10	12	12	12	18	0	1	1	9 6	29	7 6	27	2 0	[1]8 2.1
Apr* ..	20	10	6	16	9	4	13	11	0	31.5	31.6	33.2	32.1	70.0	50.2	61.4	60.5	6.2	5.7	4.7	5.5	10	8	11	12	0	0	0	1	0	8 1	1	6 0	30	2 1	6 9.0
May ...	17	9	5	3	26	10	12	10	1	41.6	41.0	45.3	42.6	64.0	44.3	60.3	56.2	5.0	5.0	4.4	4.8	12	10	9	15	0	0	0	4	0	8 1	11, 12	5 9	3 4	2 4	6 10.5
June ...	11	9	6	13	34	7	3	2	5	57.4	58.8	59.5	58.6	75.4	57.5	73.2	68.7	4.8	5.3	2.5	4.2	11	15	4	14	0	0	0	5	0	6 10	2, 3	4 6	30	2 4	5 8.6
July ...	11	2	0	4	24	11	15	19	7	57.5	56.3	59.9	57.9	75.4	54.2	73.5	67.7	4.1	5.8	3.5	4.5	11	14	6	12	0	0	1	7	1	4 5	1	1 9	25	2 8	2 9.4
Aug ...	4	2	1	5	33	13	9	18	3	57.1	60.5	60.6	59.4	82.4	61.7	78.2	74.1	4.6	5.1	2.0	3.9	11	18	2	15	0	0	0	6	0	2 3	3	1 0	18 19	1 3	1 6.3
Sept ...	5	2	2	8	41	8	10	10	4	56.5	63.5	60.0	60.0	85.8	71.4	81.8	79.7	4.4	4.5	3.5	4.1	11	15	4	13	0	0	0	10	1	10 2	16, 17	2 1	1	3 1	5 11.2
Oct	8	2	2	3	36	10	15	16	1	43.6	46.8	45.8	45.4	80.3	64.1	76.2	73.5	4.5	5.2	4.5	4.7	10	15	6	14	0	3	0	3	0	8 9	10, 11	5 1	28 29 30	3 8	7 0.1
Nov ...	17	4	3	4	29	5	6	21	1	22.1	23.6	26.4	25.7	75.5	65.5	74.0	71.7	4.9	4.9	4.2	4.7	11	10	9	12	8	16	0	1	0	5 5	2, 3, 4	2 9	25	2 8	[2]4 2.9
Dec	29	1	0	5	21	1	13	23	0	8.3	11.5	11.3	10.4	77.0	68.8	77.2	74.3	6.7	6.1	6.0	6.3	7	9	15	15	17	27	0	0	0	5 9	8, 9	3 10	16	1 11	[3]4 10.9
Sums ..	178	62	28	73	323	95	134	181	28	398.8	443.7	440.4	427.7	912.7	744.1	874.6	843.8	63.5	64.7	51.1	59.8	118	152	100	161	81	127	1	38	3	......	......	......	..	......	......
	Percentages.																					Percentages.														
Means .	16.2	5.7	2.6	6.7	29.4	8.7	12.2	16.5	2.1	33.2	37.0	36.7	35.6	76.1	62.0	72.9	70.3	5.3	5.4	4.3	5.0	31.0	41.6	27.4	44.0	22.1	34.7	0.3	10.4	0.8	......	......	......	..	......	......

* One 11 p. m. observation taken late.

[1] 7 days.

[2] 26 days.

[3] 14 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.03 a. m., 2.03 p. m., and 10.03 p. m., local time.

Correction for instrumental error of barometer used: From 6.03 a. m., January 1, to 10.03 p. m., December 31, 1884, inclusive, —.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.840; March, 0.820; April, 0.800; May, 0.760; June, 0.760; July, 0.750; August, 0.750; September, 0.770; October, 0.790; November, 0.820; December, 0.850.

WM. H. RAY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LEAVENWORTH, KANS.

Location of office on December 31, 1884, No. 315 Delaware street.

[Latitude, 39° 19′ N.; longitude, 94° 57′ W. Elevation of barometer above sea-level, 842 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain gauge above ground, 48 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.341	29.316	29.334	29.330	29.880	4	28.723	9	1.157	16.6	25.3	21.5	21.1	57.0	30	—21.0	5	78.0	30.2	12.5	.97	.82	27	29	N.	23	S.	5,586
Feb	29.180	29.153	29.168	29.167	29.565	9	28.493	18	1.072	22.8	32.3	28.7	27.9	57.0	25	— 1.0	13	58.0	37.8	19.5	1.42	.44	4	37	NW.	19	N. NW.	6,021
Mar	29.098	29.074	29.093	29.088	29.522	14	28.339	27	1.183	34.9	47.9	41.0	41.3	70.0	26 31	11.0	8	59.0	51.3	32.8	3.70	.95	31	38	NW.	2	S.	6,822
Apr	29.066	29.033	29.062	29.054	29.364	8	28.442	26	.922	44.8	58.0	49.6	50.8	75.8	29	29.0	8	46.8	60.7	42.6	4.74	1.36	19	35	NW.	2	NW.	6,562
May	29.109	29.092	29.102	29.101	29.388	29	28.739	5	.649	55.6	69.6	60.9	62.0	84.0	9	39.0	2	45.0	72.8	53.0	4.79	1.14	5	24	N.	1	NW.	4,193
June	29.146	29.112	29.120	29.126	29.316	28	28.854	8	.462	65.8	79.6	70.8	72.1	90.8	24	52.0	10 11	38.8	82.2	62.8	3.33	1.18	8	34	N.	25	SE.	2,389
July	29.084	29.053	29.049	29.062	29.329	20	28.831	8	.498	71.1	84.5	76.3	77.3	101.0	8	58.5	10	42.5	88.1	68.0	9.48	4.31	12, 13	25	N.	1, 8	S.	3,323
Aug	29.178	29.156	29.151	29.162	29.477	9	28.858	28	.619	66.1	78.6	70.7	71.8	93.0	28	50.0	10	43.0	81.2	64.0	4.65	2.07	24, 25	18	SE.	24	S.	4,187
Sept	29.117	29.067	29.088	29.091	29.477	20	28.653	23	.824	64.4	80.5	70.3	71.7	90.0	8	48.8	25	41.2	81.6	62.7	5.38	1.56	27	29	S.	30	S.	5,586
Oct	29.245	29.214	29.236	29.232	29.622	23	28.978	26	.644	52.6	68.6	57.0	59.4	86.0	4	32.0	23	54.0	70.5	49.3	3.41	1.48	20, 21	19	S.	2, 19	S.	4,373
Nov	29.241	29.207	29.231	29.226	29.610	5	28.689	22	.921	36.7	51.1	41.6	43.1	68.0	9	10.2	23	57.8	53.1	33.5	1.72	1.11	22, 23	23	NW.	22 23	S.	3,943
Dec	29.255	29.211	29.241	29.236	29.764	24	28.661	6	1.103	21.0	28.0	23.4	24.1	60.0	4	—6.0	24	66.0	31.9	18.1	1.48	.26	30	22	NW.	22	N.	4,862
Sums ..	350.060	349.688	349.875	349.875	....	...	....	...	10.054	552.4	704.0	611.8	622.6	......	...	......	...	630.1	741.4	518.8	44.72	....	......	...	....	....	....	57,847
Means .	29.172	29.141	29.156	29.156	29.880	*4	28.339	†27	.838	46.0	58.7	51.0	51.9	101.0	‡8	—21.0	*5	52.5	61.8	43.2	.....	....	......	...	....	....	S.	......

* January. † March. ‡ July.

LEAVENWORTH, KANS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.*									
										Washington time.																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan ...	20	2	3	4	30	7	7	16	4	9.8	13.2	14.3	12.4	75.8	61.5	74.5	70.6	4.8	5.8	3.5	4.7	7	18	6	10	12	26	0	0	Frozen during entire month.									
Feb ...	24	6	0	5	13	5	4	24	6	14.1	17.9	19.7	17.2	69.2	56.8	68.8	64.9	5.8	6.7	4.9	5.8	6	12	11	11	10	25	0	0	5	6	26	5	1	28	0	5	5	4.2
Mar ...	17	6	6	12	21	4	1	20	6	28.2	30.2	32.0	30.1	76.9	53.8	71.1	67.3	5.9	6.0	5.4	5.8	5	18	8	13	4	12	0	4	16	2	25	5	6	2, 3, 6, 7	10	8	8	11.8
Apr. ...	14	7	7	15	9	6	3	18	11	38.5	38.3	40.6	39.1	79.0	51.0	71.9	67.3	5.4	7.0	5.7	6.0	5	14	11	17	0	2	0	3	17	11	9	10	8	29	7	3	13	8
May ..	9	1	8	15	10	5	3	18	24	47.9	47.3	50.7	48.6	76.2	48.3	70.2	64.9	4.8	5.3	2.8	4.3	10	15	6	15	0	0	0	5	13	5	31	10	2	22	3	3	11	7.8
June ..	6	1	5	14	7	1	0	8	48	60.8	61.2	62.9	61.6	83.9	54.6	76.7	71.7	4.6	5.7	2.4	4.2	9	20	1	8	0	0	2	6	17	10	24, 25	13	6	1	4	4	15	9
July ..	12	5	7	10	18	2	1	7	31	64.3	66.1	67.7	66.0	79.6	55.8	75.7	70.4	5.0	4.6	2.4	4.0	11	18	2	14	0	0	11	10	17	3	5, 6	13	5	28	3	10	14	10.6
Aug ...	7	3	6	22	24	2	0	13	16	60.6	62.0	62.5	61.7	82.9	58.9	75.9	72.6	4.8	5.3	2.5	4.2	12	14	5	11	0	0	3	8	14	0	1	9	5	18	4	7	10	5.9
Sept ...	7	1	5	18	44	1	1	7	6	58.4	59.9	61.1	59.8	81.0	51.7	73.4	68.7	3.7	3.6	2.0	3.1	17	9	4	7	0	0	0	6	10	4	1	7	9	25	2	7	8	9.1
Oct	12	0	4	4	45	3	1	11	13	47.3	48.4	49.1	48.3	82.5	50.6	75.3	69.5	3.3	3.1	2.5	3.0	19	8	4	10	0	0	0	1	9	8	7, 8	7	7	26, 27, 28, 30, 31	2	1	8	6.5
Nov ..	20	2	3	4	29	2	1	13	16	32.2	34.8	34.1	33.7	83.2	56.3	73.4	71.0	3.1	3.9	3.9	3.6	16	8	6	6	1	8	0	0	7	7	1–4	5	0	30	2	7	7	1.1
Dec ...	30	3	4	12	14	1	2	23	4	18.4	21.4	18.7	19.5	89.7	77.5	82.5	83.3	7.2	7.3	6.4	7.0	5	12	14	14	16	22	0	0	6	6	8–10	4	8	15	1	10	5	9.2
Sums.	178	37	58	135	264	39	24	178	185	480.5	500.7	513.4	498.0	959.9	676.8	889.4	842.2	58.4	64.3	44.4	55.7	122	166	78	136	43	95	16	43	......		......	......		......	......		......	
	Percentages.																					Percentages.																	
Means	16.2	3.4	5.3	12.3	24.0	3.6	2.2	16.2	16.8	40.0	41.7	42.8	41.5	80.0	56.4	74.1	70.2	4.9	5.4	3.7	4.7	33.3	45.4	21.3	37.2	11.7	26.0	4.4	11.7	......		......	......		......	......		......	

* February, four days only; December, seventeen days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.48 a. m., 1.48 p. m., and 9.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.960; February, 0.950; March, 0.940; April, 0.910; May, 0.880; June, 0.870; July, 0.860; August, 0.860; September, 0.880; October, 0.900; November, 0.940; December, 0.960.

REMARKS.—Lunar halo on January 4 and 13. Lightning near south horizon February 13. Lunar halo on March 8, 9, and 30. Lunar halo on October 31.

CHARLES DILL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LEWISTON, IDAHO.

Location of office on December 31, 1884, corner Montgomery and Fourth streets.

[Latitude, 46° 8′ N.; longitude, 117° 5′ W. Elevation of barometer above sea-level, 780 (B) feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 86 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.416	29.384	29.373	29.391	29.987	1	28.807	27	1.180	29.0	34.5	32.2	31.9	54.0	12	10.8	1	43.2	39.1	25.9	2.15	1.25	3, 4	20	NW.	12	NE.	826
Feb	29.262	29.262	29.244	29.256	29.889	12	28.407	17	1.482	22.3	29.7	26.4	26.1	55.2	24	17.8	12	73.0	35.1	18.8	3.10	.69	9, 10	27	SW.	20	SE.	940
Mar	29.114	29.087	29.073	29.091	29.474	13	28.399	9	1.075	37.3	47.9	43.3	42.8	62.2	30	23.8	8	38.4	53.6	34.7	1.25	.50	26	19	W., SW.	10 12	NW.	1,238
Apr	29.141	29.096	29.057	29.098	29.438	7	28.668	10	.770	44.5	60.0	54.9	53.1	77.0	21	34.8	12	42.2	66.6	42.1	1.47	.62	13, 14	20	NW.	11	NE.	1,678
May	29.190	29.118	29.085	29.131	29.455	7	28.781	19	.674	51.4	72.6	66.0	63.3	92.0	31	39.0	6	53.0	79.3	48.9	.50	.17	24, 25	22	SW.	8	NE.	1,003
June	29.116	29.064	29.038	29.073	29.371	17	28.828	12	.543	59.9	74.1	69.8	67.9	95.6	1	48.7	25	46.9	80.8	57.3	5.66	1.20	24	20	NW.	22	NE.	1,010
July	29.165	29.132	29.107	29.135	29.419	8	28.879	6	.540	60.2	76.1	72.2	69.5	93.6	30	48.8	17	44.8	82.9	57.6	1.80	1.02	21, 22	22	SW.	31	NE.	1,268
Aug	29.190	29.127	29.081	29.133	29.458	29	28.918	26	.540	60.2	83.1	77.4	73.6	101.0	5	48.3	19	52.7	90.5	58.0	.06	.04	27	20	NW.	30	NE.	987
Sept	29.192	29.144	29.129	29.155	29.466	26	28.851	7	.615	49.0	63.5	57.4	56.6	81.5	20	35.0	26	46.5	68.7	46.4	1.01	.87	4	19	NW., SW.	1, 27	NE.	1,706
Oct	29.262	29.242	29.229	29.244	29.732	15	28.719	12	1.013	44.4	56.5	50.2	50.4	73.6	13	31.0	7	42.6	61.1	41.7	2.08	.42	11, 12	25	NW.	9	NE.	1,149
Nov	29.406	29.388	29.376	29.390	29.691	27	29.102	20	.589	35.3	44.7	39.0	39.7	63.0	4	23.5	30	39.5	49.4	33.2	.86	.12	3, 4	27	NW.	26	SE.	821
Dec	29.281	29.274	29.287	29.281	29.846	9	28.561	19	1.285	16.3	21.2	18.0	18.5	52.6	5	—16.0	31	68.6	25.2	11.8	2.79	.50	17, 18	23	NW.	5	SW.	839
Sums ..	350.735	350.318	350.079	350.378	.. ..	...	....	...	10.306	509.8	663.9	606.8	593.4	......	...	....	...	591.4	732.3	476.4	21.73	....	....	...	....	....	....	12,460
Means .	29.228	29.193	29.173	29.198	29.987	*1	28.399	†9	.859	42.5	55.3	50.6	49.5	101.0	‡5	—17.8	§12	49.3	61.0	39.7	......	....	....	...	....	....	NE.	......

* January. † March. ‡ August. § February.

LEWISTON, IDAHO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	0	19	1	9	0	4	0	2	58	20.9	23.4	24.7	23.0	71.5	61.6	73.8	70.0	5.5	6.0	4.9	5.5	7	16	8	6	4	25	0	0	0
Feb	0	13	2	18	0	8	2	4	40	14.8	22.1	19.6	18.8	72.2	73.5	75.9	73.9	5.3	6.1	4.7	5.4	9	10	10	15	13	21	0	0	0
Mar	0	9	1	3	0	5	7	14	54	30.0	32.8	35.0	32.6	74.8	57.0	72.8	68.2	4.4	4.7	4.0	4.4	9	15	7	8	0	10	0	0	1
Apr	1	33	2	8	1	10	3	9	23	37.7	40.6	41.8	40.0	77.5	50.9	63.6	64.0	4.5	3.3	2.3	3.4	14	15	1	7	0	0	0	0	0
May	0	15	2	7	0	3	0	7	59	45.3	42.9	46.6	44.9	79.9	36.0	51.7	55.9	2.8	2.8	2.9	2.7	18	12	1	6	0	0	1	1	0
June	2	29	1	2	0	4	0	10	42	54.9	55.6	56.4	55.6	83.0	54.1	64.5	67.4	4.7	4.7	5.8	5.1	6	17	7	17	0	0	4	2	0
July	0	20	0	5	0	5	2	9	52	53.5	49.9	53.5	52.3	70.1	41.7	54.0	58.3	3.0	3.2	3.8	3.3	17	10	4	7	0	0	5	3	0
Aug	1	18	0	3	0	5	1	9	56	50.3	47.5	48.1	48.6	70.2	29.9	36.8	45.6	1.2	1.7	1.1	1.3	26	5	0	2	0	0	17	1	0
Sept	0	25	3	7	0	13	2	13	27	41.9	43.6	42.8	42.8	77.1	50.4	59.5	62.3	4.3	4.7	3.2	4.1	10	19	1	9	0	0	0	0	1
Oct	2	20	1	4	0	6	1	9	50	39.7	41.3	43.6	41.5	83.7	58.3	79.1	73.7	4.1	4.2	4.4	4.2	13	12	6	16	0	1	0	0	0
Nov	0	5	1	10	0	2	1	3	68	31.3	37.1	35.7	34.7	85.5	75.5	87.9	83.0	4.2	5.7	2.9	4.3	13	11	6	5	0	10	0	0	0
Dec	0	1	0	2	0	4	1	2	83	11.0	15.0	13.5	13.2	79.6	77.1	82.5	79.7	6.4	7.1	6.0	6.5	6	9	16	16	21	30	0	0	0
Sums	6	207	14	78	1	69	20	91	612	431.3	451.8	461.3	448.0	934.7	669.0	802.1	802.0	49.9	54.2	46.0	50.2	148	151	67	114	38	97	27	7	2
	Percentages.																					Percentages.								
Means	0.5	18.9	1.3	7.1	0.1	6.3	1.8	8.3	55.7	35.9	37.6	38.4	37.3	77.9	55.8	66.8	66.8	4.2	4.5	3.8	4.2	40.4	41.3	18.3	31.1	10.4	26.5	7.4	1.9	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m. January 1, to 11 p. m., December 31, 1884, inclusive, +.004 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.870; February, 0.870; March, 0.860; April, 0.860; May, 0.840; June, 0.820; July, 0.810; August, 0.810; September, 0.830; October, 0.850; November, 0.870; December, 0.880.

C. E. BUTLER,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LITTLE ROCK, ARK.

Location of office on December 31, 1884, Stoddard Bank Building.

[Latitude, 34° 45′ N.; longitude, 92° 6′ W. Elevation of barometer above sea-level, 299 feet. Elevation of exposed thermometer above ground, 26 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.974	29.921	29.975	29.957	30.375	5	29.443	14	.932	30.3	41.0	35.7	35.7	72.0	31	5.5	6	66.5	44.0	27.3	3.45	1.08	14	22	N.	23	N.	4,035
Feb......	29.773	29.734	29.788	29.765	30.197	15	29.237	19	.960	43.4	52.1	47.2	47.6	76.0	4	17.0	14	59.0	57.0	38.7	9.79	3.17	6	24	W.	19	NW.	3,539
Mar	29.734	29.687	29.718	29.713	30.151	9	29.314	11	.837	47.8	60.7	54.2	54.2	78.0	11	28.0	2	50.0	63.4	45.9	4.67	1.53	5	35	SW.	28	E.	4,753
Apr......	29.670	29.628	29.639	29.646	29.962	8	29.217	14	.745	53.8	65.7	59.8	*59.8	85.0	27	35.7	9	49.3	69.5	51.9	10.24	2.99	14	40	SW.	1	NW.	4,528
May....	29.687	29.654	29.674	29.672	29.885	2	29.433	5	.452	66.7	75.5	67.8	68.9	87.3	11	53.5	6	33.8	78.9	60.9	7.33	2.42	21, 22	26	SW.	18	SW.	4,151
June	29.681	29.645	29.665	29.664	29.828	28	29.489	24	.839	70.3	82.8	74.8	76.0	95.0	24	62.3	4	32.7	86.7	67.6	2.18	.88	1, 2	21	N.	10	NE.	2,689
July.....	29.658	29.624	29.638	29.640	29.813	21	29.454	9	.359	75.9	88.5	81.2	81.9	101.3	9	68.4	12	32.9	93.2	72.9	4.23	1.66	3	32	N.	3	SW.	3,018
Aug.....	29.757	29.718	29.740	29.738	29.896	9	29.483	29	.413	70.9	85.2	76.2	77.4	98.7	28 20	59.2	6	39.5	88.8	68.4	3.26	1.04	18	20	N.	30	NE.	2,555
Sept.....	29.743	29.699	29.731	29.724	29.934	20	29.448	23	.486	70.1	83.8	75.8	76.6	93.0	11	58.2	19	34.8	86.5	67.6	5.00	1.15	28, 29	24	SE.	8	S.	1,678
Oct	29.840	29.802	29.820	29.821	30.172	23	29.567	26	.605	59.6	72.8	64.1	65.5	90.0	4 5 6 7	39.2	24	50.8	75.8	57.2	1.80	.90	26	20	NW.	8	NW.	2,559
Nov	29.850	29.798	29.828	29.825	30.254	6	29.276	22	.978	44.9	50.4	51.3	51.9	74.2	3	28.0	24	46.2	62.8	42.6	2.83	1.62	22, 23	24	SW.	30	NW.	2,477
Dec......	29.792	29.739	29.785	29.772	30.186	18	29.279	5	.907	37.2	45.2	41.3	41.2	69.0	4	13.0	19	56.0	40.1	34.2	16.92	4.55	28	22	SE.	30	E.	3,000
Sums ..	357.150	356.649	357.001	356.937	......	...	......	...	8.013	667.5	812.7	729.4	736.7	....	....	......	..	551.5	855.2	635.2	71.20	.....	....	...	....	....	....	39,580
Means .	29.763	29.721	29.750	29.745	30.375	*5	29.217	†14	.668	55.6	67.7	60.8	61.4	101.3	‡9	5.5	*6	46.0	71.3	52.9	.....	.....	....	...	....	....	NW.	......

* January. † April. ‡ July.

LITTLE ROCK, ARK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.					
										Washington time.																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																		*Ft. In.*		*Ft. In.*		*Ft. In.*	*Ft. In.*
Jan	14	12	7	6	10	9	6	11	18	24.6	26.7	27.1	26.1	79.5	58.5	71.8	69.8	4.3	5.5	5.5	5.1	10	11	10	13	4	19	0	2	0	5 10	1	3 10	29 30	2 00	4 10.9
Feb	12	6	8	8	15	6	3	21	8	38.8	39.9	38.0	38.7	82.3	66.3	71.7	73.4	5.7	6.4	4.5	5.5	10	8	11	13	0	7	0	1	0	26 8	16	4 8	1	22 00	17 0.4
Mar ...	11	10	17	15	11	8	4	13	4	40.9	40.5	42.1	41.2	77.9	52.1	66.0	65.3	4.4	4.5	5.4	4.8	11	9	11	14	0	2	0	1	0	12 0	1	7 5	24	4 7	9 6.9
Apr	10	5	9	9	17	8	6	20	6	48.4	47.8	50.2	48.8	82.6	56.1	72.9	70.5	5.6	5.4	4.3	5.1	8	17	5	12	0	0	0	1	0	13 10	29	7 5	11	6 5	10 2.4
May . .	13	15	4	6	15	20	2	10	8	58.9	59.9	60.8	59.9	85.9	61.2	79.2	75.4	5.8	5.3	2.0	4.2	13	14	4	12	0	0	0	2	0	23 9	6	9 3	31	14 6	14 1.2
June ...	13	14	11	7	5	10	4	7	19	67.9	68.2	70.7	68.9	92.2	62.2	87.6	80.7	3.4	5.3	1.7	3.5	14	15	1	6	0	0	7	2	0	12 00	6	7 6	25 26	4 6	8 10.8
July ...	7	5	7	13	10	17	3	8	23	74.0	74.3	76.0	74.8	93.7	64.1	84.7	80.8	3.2	4.2	1.8	3.1	15	14	2	9	0	0	27	2	0	10 6	4	6 3	26	4 3	7 7.0
Aug ...	8	11	7	7	6	5	3	9	37	67.0	67.7	69.7	68.1	88.0	56.8	81.0	75.3	2.9	4.6	1.2	2.9	15	15	1	8	0	0	12	0	0	8 0	1	3 11	18	4 1	5 6.7
Sept ...	2	5	8	12	15	3	1	3	41	67.3	70.9	71.3	69.8	91.3	66.3	86.9	81.5	3.6	4.5	3.4	3.8	15	10	5	11	0	0	8	1	0	6 7	6	3 6	16 17	3 1	4 6.7
Oct	11	8	4	10	6	2	1	17	34	57.0	59.3	60.0	58.8	91.2	64.2	86.5	80.6	2.8	3.8	2.5	3.0	18	9	4	4	0	0	0	0	0	12 4	8	3 5	26	8 11	5 10.2
Nov ...	6	1	4	4	7	6	3	22	37	41.8	45.7	46.0	44.5	89.0	61.9	82.6	77.8	3.7	3.6	2.8	3.2	16	10	4	8	0	1	0	0	0	9 0	30	3 3	20	5 9	5 2.6
Dec ..	12	13	14	12	4	3	1	11	23	34.0	36.9	36.0	35.8	87.9	73.8	83.3	81.7	5.9	6.9	4.7	5.8	6	13	12	12	5	11	0	2	0	23 1	31	5 3	7, 8	17 10	10 6.9
Sums..	119	105	100	109	121	97	37	152	258	620.1	637.8	648.5	635.4	1041.5	743.5	958.7	912.8	50.8	60.0	39.3	50.0	151	145	70	122	9	40	54	14	0	......	....	......	....	97 11	104 0.7
	Percentages.																					Percentages.														
Means.	10.8	9.6	9.1	9.9	11.0	8.8	3.4	13.8	23.5	51.7	53.2	54.0	53.0	86.8	62.0	79.5	76.1	4.2	5.0	3.3	4.2	41.3	39.6	19.1	33.3	2.5	10.9	14.8	3.8	0	26 8	*16	3 3	†20	8 1.9	8 8.1

* February. † November.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 a. m., 2 p. m., and 10 p. m., local time.

Corrections for instrumental error of barometer used: From 6 a. m., January 1, to 10 p. m., September 30, inclusive, —0.12 inch; from 6 a. m., October 1, to 10 p. m., December 31, 1884, inclusive, —0.17 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.330; February, 0.330; March, 0.330; April, 0.320; May, 0.310; June, 0.310; July, 0.310; August, 0.310; September, 0.310; October, 0.320; November, 0.330; December, 0.330.

REMARKS.—First frost of autumn, October 24; last frost of spring, April 9; April 1, barometer raised 10 inches.

W. U. SIMONS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LOS ANGELES, CAL.

Location of office on December 31, 1884, Baker Block, No. 242 Main street.

[Latitude 34° 3′ N.; longitude, 118° 15′ W. Elevation of barometer above sea-level, 371 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 107 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.741	29.752	29.742	29.745	30.095	1	29.449	25	.646	46.9	62.9	52.0	53.9	78.0	12	33.7	17	44.8	64.4	42.9	3.15	1.36	27, 28	24	SW., E.	28 31	NE.	5,166
Feb	29.633	29.671	29.656	29.653	29.880	19	29.183	6	.697	49.7	61.8	53.8	55.1	81.0	24	38.5	9	42.5	63.7	47.1	13.37	3.63	1, 2	40	W.	17	NE.	5,488
Mar	29.613	29.655	29.633	29.634	29.818	8	29.451	3	.367	48.9	61.7	53.8	54.8	72.5	1	37.0	27	35.5	63.5	47.4	12.36	3.18	3, 4	30	NW.	10	NE.	5,681
Apr	29.627	29.647	29.627	29.634	29.836	1	29.405	27	.431	50.4	66.0	55.3	57.2	80.0	20	41.5	1	38.5	68.4	49.1	3.58	2.20	9, 10	24	SW., W.	10 27	W.	4,512
May	29.614	29.614	29.606	29.611	29.730	10	29.466	18	.264	55.4	70.6	58.9	61.6	79.0	26	47.0	2	32.0	72.7	54.3	.39	.22	19, 20	18	W.	25 26	W.	4,026
June	29.556	29.585	29.565	29.569	29.721	14	29.398	25	.323	58.0	75.8	63.4	65.6	98.0	30	49.5	14	48.5	78.1	57.0	1.89	.87	12, 18	20	S., W.	12 23	W.	3,858
July	29.570	29.587	29.563	29.573	29.697	18	29.451	1	.246	59.7	84.5	66.3	70.2	99.0	1	51.5	16	47.5	86.9	58.6	.02	.01	8, 30	18	W.	1 14	W.	3,164
Aug	29.548	29.561	29.543	29.551	29.698	4	29.456	6	.242	61.8	84.7	67.4	71.3	101.5	29	52.5	28	49.0	87.0	60.0	.02	.01	26, 28	20	W.	15 28	W.	3,696
Sept	29.560	29.576	29.553	29.563	29.710	15	29.327	29	.383	56.7	77.1	62.6	65.5	92.5	21	45.5	17	47.0	79.9	54.1	*—	*—	5, 17, 18 24–29	18	W.	21	W.	3,583
Oct	29.592	29.606	29.599	29.599	29.788	27	29.306	1	.482	54.1	72.6	60.1	62.3	80.1	22	42.9	7	46.2	74.8	51.2	.39	.17	12, 13	24	NW.	2	W.	3,707
Nov	29.664	29.662	29.462	29.663	29.779	24	29.437	21	.342	51.2	70.7	56.9	59.6	88.0	7	38.7	27	49.3	73.2	48.0	1.07	1.01	12, 18	14	NW. SW. S., W.	4 10 20 21	W.	3,284
Dec†	29.615	29.621	29.619	29.618	29.904	31	29.236	12	.668	46.8	58.9	51.1	52.3	75.6	1	35.5	2	40.1	61.4	44.2	4.65	3.04	25, 26	34	NE.	8	NE.	4,335
Sums ..	355.338	355.537	355.368	355.413	......		......	...	5.091	639.6	846.8	701.6	729.4	......	......	......	...	520.4	873.5	618.9	40.39	....	....	...	....	....	....	50,489
Means .	29.611	29.628	29.614	29.618	30.095	‡1	29.183	§6	.424	58.3	70.6	58.5	60.8	101.5	‖29	33.7	‡17	43.4	72.8	51.2	.....	.....	....	...	....	....	W.	......

* (—) Dash indicates precipitation inappreciable. † One 7 a. m. observation missed. ‡ January. § February. ‖ August.

LOS ANGELES, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	5	27	18	9	9	8	9	4	4	35.2	38.2	41.7	38.4	67.9	47.0	70.7	61.9	3.2	4.4	3.0	3.5	17	8	6	5	0	0	0	0	0
Feb	1	25	21	7	7	4	11	9	2	42.4	43.9	45.8	44.0	78.4	57.8	77.0	71.1	5.1	5.9	3.9	5.0	11	8	10	14	0	0	0	1	0
Mar	7	20	13	4	14	14	16	5	0	44.8	47.0	48.0	46.4	84.7	61.6	81.7	76.0	5.4	7.0	5.2	5.9	9	11	11	18	0	0	0	1	0
Apr	0	15	11	2	4	12	34	9	3	47.7	51.6	51.0	50.1	90.6	62.2	85.4	79.4	4.9	5.8	2.9	4.5	11	13	6	9	0	0	0	1	0
May	0	6	8	3	14	18	43	4	2	51.7	55.2	53.1	53.3	87.9	59.0	81.5	76.1	5.6	6.1	3.6	5.1	7	16	8	4	0	0	0	0	0
June	0	10	4	0	5	9	56	1	5	54.2	58.4	57.4	56.7	87.6	57.7	81.3	75.5	6.9	5.5	4.9	5.8	8	9	13	6	0	0	2	1	0
July	0	10	1	2	1	16	47	0	16	56.6	61.7	60.1	59.5	89.5	47.1	80.6	72.4	2.5	.2	.6	1.1	24	7	0	0	0	0	5	0	0
Aug	1	13	2	0	4	16	49	0	8	57.5	62.8	61.1	60.5	87.0	49.0	81.8	72.6	1.7	1.4	.6	1.2	23	8	0	0	0	0	7	0	0
Sept	2	14	1	1	6	16	41	1	8	50.9	57.0	57.4	55.1	82.2	52.0	83.4	72.5	2.7	3.0	1.5	2.4	20	8	2	0	0	0	1	0	0
Oct	5	19	0	1	7	11	35	3	12	48.8	51.7	53.3	51.1	83.2	51.3	80.8	71.8	1.1	1.9	1.0	1.8	25	4	2	2	0	0	0	1	0
Nov	1	25	6	3	6	7	28	4	10	44.9	49.5	50.8	48.4	81.4	50.9	81.2	71.2	2.8	2.0	1.4	1.9	21	7	2	3	0	0	0	0	0
Dec	2	27	14	9	5	1	16	7	11	42.3	45.2	45.7	44.4	85.3	63.5	82.7	77.2	3.0	4.7	3.8	3.8	13	11	6	10	0	0	0	0	0
Sums ..	24	211	94	41	82	132	385	47	81	576.0	622.2	625.4	607.9	1005.7	659.1	968.1	877.7	44.4	47.9	32.4	41.5	189	110	66	71	0	0	15	5	0
	Percentages.																					Percentages.								
Means .	2.2	19.2	8.6	3.7	7.5	12.0	35.1	4.3	7.4	48.0	51.8	52.1	50.6	83.8	54.9	80.7	73.1	3.7	4.0	2.7	3.5	51.8	30.1	18.1	19.4	0	0	4.1	1.4	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.15 a. m., 12.15 p. m., and 8.15 p. m., local time.

Correction for instrumental error of barometer used: From 4.50 a. m., January 1, to 8.15 p. m., December 31, 1884, inclusive, +.011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.400; February, 0.400; March, 0.400; April, 0.400; May, 0.400; June, 0.390; July, 0.390; August, 0.390; September, 0.390; October, 0.400; November, 0.400; December, 0.400.

REMARKS.—January 4, slight shock of earthquake felt; heavy frosts during month. February 6, hail fell; solar halo on 26th and 27th; frosts on 8th, 9th, and 13th. March 21, solar halo; lunar halo, 12th; frosts on 11th, 24th, 25th, and 27th. April 1, 4, and 5, lunar halos. Frequent fogs during month of May. June 16, slight shock of earthquake felt. July 27, polar bands; remarkably red appearance of sky after sunset noted during the month. August 2, 3, and 15, polar bands; red sunsets noted during month. September, remarkably brilliant red sunsets observed during the month. October 22, slight shock of earthquake; lunar halo, 28th; red sunsets during month. November 4, lunar halo; red sunsets noted frequently during month. December 2, first frost of the season; frost on 3d, 6th, 13th, 14th, 15th, 16th, and 17th; red sunsets noted during the month: lunar corona 31st.

GEORGE E. FRANKLIN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LOUISVILLE, KY.

Location of office on December 31, 1884, corner Fourth and Green streets.

[Latitude, 38° 15′ N.; longitude, 85° 45′ W. Elevation of barometer above sea-level, 530 feet. Elevation of exposed thermometer above ground, 89 feet. Elevation of rain-gauge above ground, 102 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	29.607	29.555	29.599	29.587	30.126	26	29.072	31	1.054	24.8	31.0	26.4	27.4	62.5	30	—19.5	5	82.0	35.5	19.0	1.94	.54	14	36	SW.	1	SW.	6,971
Feb	29.482	29.427	29.466	29.458	29.947	15	28.834	19	1.118	39.6	46.4	41.8	42.6	70.0	12	8.8	29	61.2	51.9	34.1	9.84	3.28	5, 6	44	SW.	19	W.	6,041
Mar	29.456	29.414	29.440	29.437	29.848	9	28.865	1	.983	41.7	51.7	46.8	46.7	75.0	28	13.5	3	61.5	54.2	39.9	3.76	1.08	11	40	SW.	25	W.	*6,619
Apr	29.372	29.341	29.360	29.358	29.604	11	28.808	14	.796	49.6	60.2	54.3	54.7	83.1	30	37.1	6–9	46.0	62.7	47.6	2.91	.89	21, 22	38	W.	2	W.	6,341
May	29.423	29.377	29.398	29.399	29.713	29	29.101	18	.612	60.9	72.3	64.2	65.8	89.0	22	46.0	29	43.0	75.3	57.9	5.75	2.10	4	28	SW., W.	6, 9	S.	5,323
June	29.467	29.424	29.434	29.442	29.685	16	29.072	9	.613	70.0	79.7	72.8	74.2	95.2	23	58.3	11	36.9	82.5	67.2	3.59	1.25	9	22	W.	8	S.	3,995
July	29.395	29.358	29.369	39.374	29.609	21	29.187	9	.422	71.8	82.7	74.8	76.4	94.2	24	61.8	21	32.4	85.2	68.9	3.94	1.45	3, 4	27	SW.	26	N.	4,278
Aug	79.510	29.458	29.480	29.483	29.686	9	29.128	29	.558	68.2	82.6	73.5	74.8	92.5	19	57.0	10	35.5	84.5	66.2	4.81	2.87	28, 29	23	W.	21	S.	3,780
Sept	20.531	29.479	29.508	29.506	29.750	14	29.272	23	.478	67.5	81.4	73.1	73.7	92.0	9	55.9	21	36.1	82.8	66.2	5.90	1.51	27	28	W., S.	27 28	S.	4,152
Oct	29.618	29.559	29.578	29.585	29.873	15	29.311	8	.562	57.0	71.1	61.8	63.3	90.0	2	36.0	23 24	54.0	73.0	55.3	2.00	.71	27	22	W.	8	N.	4,522
Nov	29.557	29.530	20.541	29.543	29.940	6	29.005	23	.935	43.1	58.4	47.4	48.0	69.1	10	19.5	24	49.6	56.9	39.7	1.86	.91	23	36	SW.	23	S.	5,081
Dec	29.577	29.533	29.556	29.555	30.047	19	28.880	6	1.167	35.7	39.9	37.3	37.6	65.5	30	— 5.0	19	70.5	45.4	30.1	5.11	1.58	11	31	SW.	14	N.	6,111
Sums ..	353.996	353.455	353.729	353.727	....	...	......	...	9.298	629.9	752.4	673.2	685.2	..	....	.....	...	608.7	789.9	592.1	51.41	....	......	...	....	....	....	63,164
Means .	29.500	29.454	29.477	29.477	30.126	†26	28.808	‡14	.774	52.5	62.7	56.1	57.1	95.2	§23	—19.5	†5	50.7	65.8	49.8	.....	....	......	...	....	....	S.	......

* Thirty and two-third days. † January. ‡ April. § June.

LOUISVILLE, KY.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.											
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	*Ft.*	*In.*		*Ft.*	*In.*		*Ft.*	*In.*	*Ft.*	*In.*
Jan ...	14	9	2	11	16	20	13	8	0	18.6	23.2	19.6	20.5	77.4	73.7	75.8	75.6	6.8	7.1	4.8	6.2	6	13	12	12	14	24	0	1	19	10	1	7	0	13	12	10	10	6.5
Feb ...	12	5	4	9	15	14	16	8	4	32.6	36.8	34.8	34.7	76.0	70.5	76.9	74.5	7.1	7.4	5.6	6.7	5	9	15	15	2	9	0	3	46	7	15, 16	10	10	29	35	9	32	11.2
Mar ..	9	10	9	13	10	11	20	8	3	34.1	35.0	36.6	35.2	74.7	56.4	68.3	66.5	7.0	7.0	6.8	6.9	3	12	16	12	1	9	0	1	25	10	14	8	6	6, 7	17	4	16	5
Apr ...	8	18	5	13	4	10	22	7	3	40.0	41.3	42.5	41.3	71.3	52.8	66.0	63.4	6.5	7.3	4.7	6.2	7	8	15	13	0	0	0	3	11	8	1	7	7	19	4	1	9	8.6
May ..	12	11	7	9	20	11	10	9	4	55.0	58.6	58.1	57.2	81.3	63.1	81.2	75.2	4.8	5.6	2.6	4.3	10	16	5	12	0	0	0	7	9	5	1	6	10	31	2	7	8	1.9
June ..	15	10	10	9	18	7	6	5	10	63.7	66.6	67.0	65.8	80.9	65.9	83.0	76.6	6.5	7.9	5.2	6.5	4	14	12	12	0	0	5	7	7	3	20	5	1	30	2	2	6	2
July ..	21	1	3	5	15	20	15	10	3	65.7	66.2	67.6	66.5	81.4	59.2	79.0	73.2	5.4	6.3	3.6	5.1	5	20	6	12	0	0	4	7	7	0	2, 3	3	2	26-28	3	10	5	0.6
Aug ...	13	10	3	9	19	14	9	7	9	61.9	61.7	64.9	62.8	80.2	50.7	74.9	68.6	2.7	5.5	2.1	3.4	15	13	3	6	0	0	7	6	6	0	7	3	0	27	3	0	3	11.1
Sept ..	8	9	2	17	22	12	5	5	10	61.8	64.7	65.1	63.9	82.4	59.1	79.6	73.7	5.4	5.8	3.7	5.0	12	10	8	7	0	0	4	10	3	5	1	2	7	24	0	10	2	11.4
Oct ...	18	10	4	11	16	15	6	6	7	52.1	54.9	54.8	53.9	83.9	57.7	78.8	73.5	3.6	3.8	1.8	3.1	14	15	2	7	0	0	0	1	3	11	3, 4	2	7	9-12, 15	1	4	3	0
Nov ...	9	6	1	13	19	12	11	10	9	37.0	39.4	39.0	38.5	79.4	61.0	73.0	71.2	3.4	5.1	4.2	4.2	13	9	8	6	0	3	0	0	3	11	11, 12	2	9	8, 9	1	2	3	3.3
Dec ..	16	7	8	15	9	14	12	10	2	30.0	31.3	30.7	30.7	79.8	73.0	77.9	76.9	8.1	7.6	6.6	7.4	7	3	21	16	6	12	0	0	9	5	30	3	3	1-3	6	2	6	1
Sums.	155	106	58	134	183	160	145	93	64	552.5	579.7	580.7	571.0	948.7	743.1	914.4	868.9	67.3	76.4	51.7	65.0	101	142	123	130	23	57	20	46	......		......	......		....	91	1	108	2.6
	Percentages.																					Percentages.																	
Means	14.1	9.6	5.3	12.2	16.7	14.6	13.2	8.5	5.8	46.0	48.3	48.4	47.6	79.1	61.9	76.2	72.4	5.6	6.4	4.3	5.4	27.6	38.8	33.6	35.5	6.3	15.6	5.5	12.6	46	7	*15, 16	2	7	†24 ‡9-12 ‡15	7	7.1	9	0.2

* February. † September. ‡ October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.25 a. m., 2.25 p. m., and 10.25 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .020 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.590; February, 0.590; March, 0.590; April, 0.570; May, 0.550; June, 0.550; July, 0.550; August, 0.550; September, 0.550; October, 0.570; November, 0.590; December, 0.600.

REMARKS.—January 5 coldest day recorded at station; minimum, −19°.5. February 15 and 16 river reached 46 feet 7 inches, this being the highest water ever observed at this point. River above danger line from February 4, 9.25 p. m., to February 25, 1.25 p. m.

E. B. GARRIOTT,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LYNCHBURG, VA.

Location of office on December 31, 1884, First National Bank Building.

[Latitude, 37° 25′ N.; longitude, 79° 9′ W. Elevation of barometer above sea-level, 652 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 50 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.460	29.407	29.447	29.438	30.105	27	28.611	8	1.494	29.6	37.9	32.1	33.2	52.0	1	1.8	7	50.2	40.5	24.8	8.48	3.92	8	24	NW.	9	SW.	2,763
Feb	29.380	29.352	29.385	29.372	29.950	16	28.723	28	1.227	41.5	51.2	44.2	45.6	69.0	6 13	11.2	29	57.8	53.7	36.4	9.02	2.40	15	26	NW.	23	S.	3,154
Mar	29.343	29.289	29.348	29.327	29.710	13	28.853	28	.857	42.4	54.5	46.1	47.7	72.0	25 26	16.0	1	56.0	56.1	38.7	8.14	1.30	23	24	NW.	30	NW.	3,446
Apr	29.243	29.174	29.233	29.217	29.527	12	28.577	2	.950	48.6	61.9	51.7	54.1	83.2	29	33.3	12	49.9	63.1	45.2	2.35	.91	21, 22	28	W.	2	NW.	3,391
May	29.318	29.245	29.290	29.284	29.613	3	29.027	6	.586	61.9	76.1	64.2	67.4	90.6	23	45.0	17	45.6	77.2	57.5	2.74	.70	26	17	NW.	24	S.	2,574
June*	29.405	29.361	29.380	29.382	29.757	15	29.003	25	.754	67.2	78.8	68.9	71.6	91.5	22	50.5	15	41.0	80.8	62.6	4.16	1.30	25	18	SW.	9	NE., S.	2,053
July	29.258	29.199	29.244	29.234	29.455	21	29.030	29	.425	72.0	84.8	73.1	76.6	95.5	24	57.4	9	38.1	85.6	66.5	2.32	.81	26, 27	16	NW.	25 31	SW.	2,174
Aug	29.399	29.350	29.392	29.380	29.584	25	29.067	30	.517	69.4	83.6	71.4	74.8	92.5	20	57.8	14	34.7	84.8	65.8	2.85	1.69	28, 29	17	NW.	21	NE.	1,890
Sept	29.476	29.400	29.455	29.444	29.774	14	29.115	17	.659	64.8	83.2	68.6	72.2	94.1	8	47.0	15	47.1	83.4	61.6	1.24	1.24	11, 12	20	S.	11	S.	1,860
Oct	29.517	29.431	29.490	29.479	29.883	26	29.133	8	.750	55.0	73.2	59.5	62.6	91.8	6	32.7	26	58.6	74.1	52.8	.54	.24	30	20	NW.	18	S.	2,098
Nov	29.443	29.375	29.422	29.413	29.756	22	28.798	28	.958	39.0	55.3	43.3	45.9	72.0	2	27.0	22	45.0	56.7	36.0	3.63	1.40	30	20	NW., S.	5 23	NW.	2,856
Dec	29.498	29.434	29.487	29.473	29.921	27	28.889	6	1.082	35.5	46.2	38.7	40.1	68.0	12	5.5	19	62.5	47.9	32.4	11.81	6.74	21	19	NW.	16	NE.	2,728
Sums ..	352.740	352.017	352.578	352.443	......	.	......	...	10.209	626.9	786.7	661.8	691.8	..	..	......	..	586.5	803.9	580.3	57.28	....	......	...	....	....	....	30,487
Means .	29.395	29.335	29.381	29.370	30.105	†27	28.577	‡12	.851	52.2	65.6	55.2	57.7	95.5	§24	1.8	†7	48.9	67.0	48.8	....	....	......	...	....	....	S.	......

* One 11 p. m. observation missed.

† January.

‡ April.

§ July.

LYNCHBURG, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	0	12	8	7	11	21	8	15	11	21.2	19.1	22.4	20.9	70.6	49.6	67.5	62.6	6.8	6.0	4.7	5.8	8	9	14	12	2	24	0	0	0
Feb	8	16	6	1	20	11	9	11	10	34.8	32.4	34.4	33.9	77.6	51.8	69.9	66.4	6.4	6.7	5.4	6.2	7	9	13	18	1	10	0	1	0
Mar	2	13	5	3	16	8	12	23	11	33.7	35.6	36.3	35.2	72.9	52.0	70.2	65.0	6.6	6.0	5.4	6.0	6	18	12	17	0	6	0	3	0
Apr......	1	17	3	3	6	7	14	23	16	40.3	44.1	42.4	42.3	73.8	54.2	71.6	66.5	5.9	6.4	5.0	5.8	5	17	8	11	0	0	0	0	0
May	3	6	4	6	29	11	18	9	12	54.7	59.0	57.2	57.0	78.2	56.5	78.9	71.2	4.2	5.9	4.4	4.8	11	12	8	9	0	0	1	6	0
June......	7	15	9	9	15	6	2	6	20	62.6	65.6	64.3	64.2	85.5	65.5	85.5	78.8	6.0	6.1	5.6	5.9	7	10	12	15	0	0	2	2	0
July......	5	5	8	1	9	24	13	12	21	62.5	60.5	64.2	62.4	72.8	45.9	74.4	64.4	4.0	5.1	3.9	4.3	10	17	4	13	0	0	3	6	0
Aug......	4	19	12	3	4	5	5	15	26	62.7	60.7	65.0	62.8	79.7	47.5	80.6	69.3	4.9	6.3	3.3	4.8	8	18	5	10	0	0	2	2	0
Sept......	1	13	5	7	16	7	3	6	32	57.2	53.9	59.4	56.8	76.9	38.0	73.5	62.8	3.6	4.1	2.6	3.4	15	18	2	2	0	0	4	0	0
Oct......	0	12	6	5	14	9	9	11	27	47.7	45.7	49.8	47.7	77.0	40.9	71.3	63.1	3.2	4.1	3.6	3.6	17	8	6	5	0	0	4	0	0
Nov	3	8	6	4	13	12	14	17	13	31.0	32.0	33.6	32.2	74.6	45.8	70.0	63.5	3.7	4.0	3.7	3.8	16	7	7	6	0	5	0	1	0
Dec	3	27	3	0	16	16	12	6	10	29.9	34.9	32.5	32.4	80.9	66.6	79.2	75.6	6.5	6.5	6.2	6.4	4	14	13	10	2	13	0	0	0
Sums...	32	163	70	49	169	137	114	154	209	538.3	543.5	561.5	547.8	920.5	614.3	892.6	809.2	61.8	67.2	53.8	60.8	114	147	104	128	5	58	16	21	0
	Percentages.																					Percentages.								
Means .	2.9	14.9	6.4	4.5	15.4	12.5	10.4	14.0	19.1	44.9	45.3	46.8	45.7	76.7	51.2	74.4	67.4	5.2	5.6	4.5	5.1	31.2	40.3	28.5	35.0	1.4	15.8	4.4	5.7	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.52 a. m., 2.52 p. m., and 10.52 p. m., local time.

Correction for instrumental error of barometer used: From 6.52 a. m., January 1, to 10.52 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.710; May, 0.680; June, 0.670; July, 0.670; August, 0.670; September, 0.680; October, 0.690; November, 0.720; December, 0.730.

REMARKS.—Last frost of season, April 12; polar bands observed p. m., May 20; a brilliant meteor observed at 9.04 p. m., June 23; first light frost of season, October 16; first killing frost and ice, October 24; first snow of season, November 30.

JNO. HEALY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MACKINAW CITY, MICH.

Location of office on December 31, 1884, corner Huron avenue and E street.

[Latitude, 45° 47′ N.; longitude, 84° 39′ W. Elevation of barometer above sea-level, 605 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In*	*In.*						*Miles.*
Jan	29.382	29.354	29.384	29.373	30.033	26	28.638	30	1.395	11.1	16.6	13.1	13.6	39.8	17	−15.9	24	55.7	20.9	4.2	8.09	1.75	30, 31	36	SW.	17	W.	7,820
Feb	29.371	29.363	29.365	29.366	29.952	10	28.714	19	1.238	9.1	18.0	12.3	13.1	39.0	19	−16.6	28	55.6	20.5	2.6	5.10	.78	12	29	NW.	19	E.	5,938
Mar	29.374	29.349	29.361	29.361	29.820	30	28.571	11	1.249	17.0	29.1	22.8	23.0	52.2	11	−20.2	2	72.4	31.6	12.6	1.21	.87	22, 23	40	SW.	12	W.	6,431
Apr	29.343	29.307	29.315	29.322	29.936	21	28.634	15	1.302	33.5	42.7	35.8	37.3	66.1	27	19.1	6	47.0	44.6	29.4	.99	.60	15, 16	28	NE., SE., W., NW.	15, 27, 28	W.	6,694
May	29.270	29.261	29.275	29.269	29.718	29	28.878	19	.840	44.8	52.3	46.0	47.7	73.0	31	33.0	2, 3	40.0	55.2	40.2	1.67	.55	13	30	NW., NE.	15 28	W.	5,986
June	29.447	29.420	29.410	29.426	29.942	14	29.108	24	.834	58.7	65.9	58.1	60.9	81.4	29	43.5	15	37.9	69.5	52.6	2.29	1.07	22, 23	32	E.	25	E.	4,789
July	29.230	29.221	29.233	29.228	29.486	7	28.818	5	.668	59.5	65.9	58.5	61.3	77.8	22	47.3	17	30.5	68.4	53.7	2.51	.78	4	26	SW.	5	W., NW.	6,265
Aug	29.347	29.331	29.335	29.338	29.748	9	28.958	29	.790	59.8	66.9	60.0	62.2	89.4	20	41.8	8	47.6	69.9	54.2	3.28	1.10	29, 30	25	W.	8	NW.	6,000
Sept	29.324	29.305	29.327	29.319	29.892	13	28.632	24	1.260	57.8	65.4	58.5	60.6	88.9	10	41.7	23	47.2	69.2	52.9	1.96	.89	28	32	SW.	16	E., SW.	7,016
Oct	29.401	29.364	29.379	29.381	29.925	14	28.971	5	.954	46.0	52.3	48.2	48.8	79.0	3	27.7	25	51.3	55.6	41.9	3.85	1.01	2	36	SW.	20	NW.	9,246
Nov	29.330	29.310	29.340	29.327	29.606	3	28.601	23	1.095	32.4	36.9	33.6	34.3	57.1	9	12.0	24	45.1	40.1	28.5	2.89	1.06	22, 23	34	NW.	23	NW.	8,720
Dec	29.334	29.341	29.368	29.348	29.952	25	28.661	6	1.291	24.5	26.4	24.5	25.1	47.5	29	−5.0	18	52.5	29.7	19.1	6.48	1.05	7, 8	44	E.	22	NW.	8,041
Sums	352.153	351.926	352.092	352.058	.....	...	.....	...	12.916	454.2	538.4	471.4	487.9	.....	.....	.....	...	582.8	575.2	391.9	40.32	....	.....	...	....	....	....	82,946
Means	29.346	29.327	29.341	29.338	30.033	*26	28.571	†11	1.076	37.8	44.9	39.3	40.7	89.4	‡20	−20.2	§2	48.6	47.9	32.7	.....	....	.....	...	....	....	NW.	......

* January. † March. ‡ August. § March.

MACKINAW CITY, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloud	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	6	6	6	8	9	31	16	1	5.6	10.6	7.1	7.8	78.4	77.6	76.9	77.6	7.8	7.6	6.0	7.1	8	13	15	17	27	31	0	0	0
Feb	4	10	21	3	4	6	16	20	3	4.6	9.8	7.6	7.3	81.8	71.9	81.2	78.3	6.9	7.0	6.8	6.9	4	10	15	19	25	29	0	0	1
Mar	4	6	15	11	8	12	17	13	12	11.2	21.0	16.3	16.2	77.5	72.1	75.9	75.2	6.0	5.9	3.8	5.2	9	13	9	10	14	28	0	0	2
Apr	12	4	18	11	1	3	19	17	5	26.8	28.6	28.1	27.8	76.7	60.1	73.9	69.2	5.1	4.9	4.4	4.8	12	8	10	7	0	22	0	0	0
May	6	12	15	16	2	5	17	11	9	38.1	39.3	39.0	38.8	77.8	63.9	77.5	73.1	5.4	5.5	5.2	5.4	8	13	10	13	0	0	0	1	0
June	4	4	25	9	4	3	16	16	9	52.6	53.8	52.9	53.1	81.0	66.7	82.9	76.9	3.9	4.3	2.8	3.7	17	8	5	7	0	0	0	1	0
July	3	4	9	7	3	11	25	25	6	52.5	53.1	50.9	52.2	78.2	65.5	76.8	73.5	5.3	5.8	4.5	5.2	7	18	6	11	0	0	0	2	0
Aug	7	1	8	10	9	16	14	22	6	54.2	54.2	53.7	54.0	81.8	65.3	79.9	75.7	4.9	4.8	4.8	4.7	11	13	7	13	0	0	0	0	0
Sept	2	2	16	8	15	16	15	14	2	51.9	58.2	51.6	52.2	81.3	67.0	78.6	75.6	6.3	5.0	4.3	5.2	8	13	9	16	0	0	0	1	0
Oct	4	4	8	5	13	17	15	27	0	39.6	40.1	40.0	39.9	79.1	65.7	74.0	72.9	7.2	5.5	6.5	6.4	6	10	15	19	0	4	0	1	0
Nov	12	3	8	4	10	11	18	24	0	28.0	28.9	27.1	28.0	83.4	74.1	76.7	78.1	8.3	7.8	6.9	7.7	2	8	20	14	8	17	0	0	0
Dec	15	6	14	6	9	12	13	18	0	20.2	20.8	18.9	20.0	83.1	79.5	79.2	80.6	9.1	8.4	8.9	8.8	0	5	26	20	15	25	0	0	0
Sums	83	62	163	96	81	121	216	223	53	385.3	413.4	393.2	397.3	960.1	829.4	933.5	907.7	76.2	72.5	64.4	71.1	87	132	147	166	89	156	0	6	3
	Percentages.																					Percentages.								
Means	7.6	5.6	14.8	8.8	7.4	11.0	19.7	20.3	4.8	32.1	34.4	32.8	33.1	80.0	69.1	77.8	75.6	6.4	6.0	5.4	5.9	23.8	36.1	40.2	45.4	24.3	42.6	0	1.6	.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.30 a. m., 2.30 p. m., and 10.30 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January 0.700; February, 0.700; March, 0.700; April, 0.680; May, 0.650; June, 0.640; July, 0.640; August, 0.640; September, 0.650; October, 0.670; November, 0.690; December, 0.700.

D. B. NOTSON,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MACON, FORT, N. C.

Location of office on December 31, 1884, Hospital Building.

[Latitude, 34° 42′ N.; longitude, 76° 40′ W. Elevation of barometer above sea-level, 11 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 5 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.200	30.153	30.198	30.182	30.726	27	29.453	8	1.273	39.4	44.1	40.5	41.5	60.5	8	8.5	6	52.0	47.8	32.9	5.73	2.51	8	68	SE.	8	SW.	12,271
Feb	30.110	30.091	30.134	30.112	30.564	16	29.424	28	1.140	50.2	56.3	52.1	52.9	66.2	20	24.3	29	41.9	59.4	45.3	2.34	.64	17, 18	64	SW.	28	SW.	10,649
Mar	30.073	30.011	30.073	30.052	30.441	16	29.562	2	.879	51.5	58.4	54.4	54.8	70.7	29	25.6	4	45.1	60.3	48.1	4.10	1.00	13, 14	48	NW., SE.	8 26	NW., SW.	11,625
Apr	29.927	29.873	29.917	29.906	30.230	12	29.286	2	.944	54.4	61.8	56.0	57.2	74.3	29	40.7	10	33.6	63.1	50.2	2.47	.83	21, 22	52	SW.	2	SW.	10,790
May	30.004	29.970	29.996	29.990	30.260	3	29.705	11	.555	67.6	72.9	67.5	69.3	79.2	23	53.4	30	25.8	74.1	63.5	3.38	1.55	9	33	SW.	2	SW.	9,384
June	30.075	30.046	30.061	30.061	30.296	16	29.784	10	.512	71.	76.8	71.7	73.2	83.4	26	55.1	2	28.3	78.2	67.4	1.65	.46	26, 27	35	S.	12	SW.	8,417
July	29.955	29.918	29.943	29.939	30.141	22	29.752	16	.389	77.6	82.2	77.5	79.1	86.2	15	66.8	9	19.4	83.0	73.9	4.36	1.10	18, 19	46	SW.	31	SW.	9,128
Aug	30.046	30.026	30.044	30.039	30.205	19	29.795	30	.410	74.9	79.4	75.5	76.6	85.0	22 23 24	65.3	14	19.7	80.6	72.1	6.86	2.04	1, 2	42	NW.	1	SW.	9,942
Sept	30.125	30.096	30.123	30.115	30.283	26	29.816	17	.467	73.2	79.0	74.4	75.5	85.0	10	64.8	15	20.7	80.3	70.6	5.56	4.88	12	44	N.	14	NE., SE.	9,936
Oct	30.167	30.121	30.152	30.147	30.526	20	29.881	30	.645	64.8	71.8	66.6	67.7	83.9	6	43.8	24	40.1	73.6	61.9	.34	.27	30	40	NE.	14	NE.	9,224
Nov	30.119	30.079	30.102	30.100	30.419	7	29.523	28	.896	52.3	60.4	54.7	55.8	70.1	3	37.0	25	32.5	62.7	48.9	3.06	1.18	28	55	SW.	29	NE.	8,375
Dec.	30.195	30.147	30.165	30.169	30.544	20	29.805	18	.739	45.6	52.8	47.9	48.8	68.1	30	15.2	19	52.9	55.0	40.8	5.40	1.53	14, 15	44	NW.	18	N.	11,824
Sums	360.996	360.531	360.903	360.812	....	..	....	...	8.849	722.6	795.4	738.8	752.2			....	...	412.0	818.1	675.6	45.28	....	......	...	....	...	......	121,565
Means	30.083	30.044	30.075	30.067	30.726	*27	29.286	†12	.737	60.2	66.3	61.6	62.7	86.2	‡15	8.5	*6	34.3	68.2	56.3	....	.....	......	...	....	...	SW.	....

* January. † April. ‡ July.

MACON, FORT, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	20	13	0	4	6	23	9	18	0	34.0	35.8	34.9	34.9	81.2	73.7	80.9	78.6	6.8	5.9	4.8	5.7	6	16	9	13	1	14	0	1	0
Feb	12	10	2	8	10	30	4	11	0	47.0	49.5	47.4	48.0	89.2	78.7	84.7	84.2	6.3	5.8	4.4	5.5	8	13	8	18	0	1	0	2	0
Mar	5	10	3	13	10	23	5	23	1	40.0	46.7	47.2	46.6	82.5	69.2	78.7	76.8	6.1	5.4	3.7	5.1	9	13	9	17	0	2	0	1	0
Apr	12	17	7	8	5	20	3	18	0	47.9	48.8	48.8	48.5	79.8	67.8	78.6	75.4	5.0	4.8	3.3	4.4	11	12	7	9	0	0	0	1	0
May	6	22	3	13	12	31	1	5	0	62.4	62.5	62.8	62.6	84.0	71.1	85.7	80.3	5.1	3.8	3.1	4.0	12	15	4	11	0	0	0	3	1
June	14	13	1	9	20	23	1	6	3	67.2	68.3	68.0	67.8	87.7	75.9	88.5	84.0	6.2	5.6	3.9	5.2	7	18	10	11	0	0	0	3	0
July	2	6	0	6	10	59	3	7	0	71.9	72.5	71.9	72.1	83.2	74.4	83.6	80.4	4.2	4.8	3.5	4.2	12	12	7	14	0	0	0	4	0
Aug	15	19	4	9	15	24	3	3	1	71.3	71.4	71.2	71.3	89.0	77.2	86.9	84.4	6.5	7.1	4.0	5.9	6	15	10	12	0	0	0	3	0
Sept	8	26	5	26	10	7	2	6	0	68.5	68.3	69.0	68.6	85.7	70.5	88.8	80.0	4.0	4.2	1.7	3.8	14	13	3	4	0	0	0	0	0
Oct	16	29	9	9	3	16	4	7	0	58.9	60.3	60.2	59.8	82.2	68.7	80.7	77.4	3.7	3.0	1.5	2.7	19	7	5	4	0	0	0	0	0
Nov	20	22	5	3	8	12	4	18	3	47.4	50.0	49.3	48.9	84.0	69.9	83.6	79.2	4.8	4.1	3.0	4.0	13	13	4	9	0	0	0	0	0
Dec	23	22	3	3	8	16	5	11	2	40.8	45.0	44.3	43.4	82.4	75.7	87.4	81.8	6.6	5.9	5.7	6.1	6	13	12	19	1	6	0	1	0
Sums	153	209	42	111	112	284	44	133	10	663.3	679.1	675.0	672.5	1010.9	872.8	1003.1	962.3	65.3	60.4	42.1	56.1	123	155	88	136	2	23	0	19	1
	Percentages.																					Percentages.								
Means	13.9	19.0	3.8	10.1	10.2	26.0	4.0	12.1	.9	55.3	56.6	56.2	56.0	84.2	72.7	83.6	80.2	5.4	5.0	3.5	4.6	33.6	42.3	24.1	37.2	.1	6.3	0	5.2	.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time.

Correction for instrumental error of barometer used: From 7.02 a. m., January 1, to 11.02 p. m., December 31, 1884, inclusive, +.015 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—January 6, coldest day in twenty years. March, last frost, 16th. December, first light frost, 10th; first killing frost, 18th.

WILLIAM DALY,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MAGINNIS, FORT, MONT.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 47° 12′ N.; longitude, 109° 10′ W. Elevation of barometer above sea-level, 4,340 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 22 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	25.576	25.541	25.529	25.549	25.897	3	25.139	29	.758	17.8	25.1	20.8	21.1	48.1	12	−20.8	4	68.4	29.1	12.0	1.47	.22	9	52	SW.	11	W.	10,602
Feb	25.445	25.420	25.444	25.436	25.893	26	25.038	15	.855	4.5	14.4	9.0	9.3	51.1	24	−28.2	11	79.3	18.8	.6	.69	.18	27, 28	56	SW.	22	NW.	7,891
Mar	25.457	25.469	25.470	25.465	25.858	12	24.903	10	.955	22.3	32.9	24.3	26.5	53.1	24	−14.1	7	67.2	34.6	18.9	.56	.16	27	52	NW.	10	W.	6,574
Apr	25.516	25.496	25.510	25.507	25.868	18	25.108	12	.760	30.6	45.2	33.9	36.6	65.8	23	−16.9	27	48.9	46.7	27.9	.62	.14	7	52	W.	18	NW.	6,586
May	25.569	25.553	25.575	25.566	25.833	30	25.205	3	.628	44.1	61.3	46.3	50.6	78.4	25 26	29.6	12	48.8	62.7	39.9	.76	.28	28, 29	40	NW., NE.	9 29	SW.	7,425
June	25.567	25.536	25.547	25.550	25.800	18	25.380	10	.420	53.8	69.4	57.6	60.3	87.6	20	43.4	27	44.2	71.8	50.4	1.21	.34	23	44	SE.	23	SW.	6,456
July	25.603	25.569	25.580	25.584	25.724	18	25.376	31	.348	52.2	68.8	54.9	58.6	81.8	31	37.0	5	44.8	71.6	49.7	.64	.19	21, 22	52	NW.	31	SW.	7,269
Aug	25.652	25.619	25.644	25.638	25.832	5	25.365	1	.467	53.8	72.0	56.6	60.8	88.9	10	36.0	20	52.9	74.5	51.8	1.33	.54	1	48	NW.	1	SW.	6,740
Sept	25.517	25.487	25.498	25.501	25.770	19	25.248	2	.522	40.2	56.1	44.9	47.1	78.8	20	25.7	30	53.1	57.4	38.2	.26	.14	7, 8	40	NE., NW.	27 8	W.	7,422
Oct	25.550	25.529	25.554	25.544	25.936	16	25.201	1	.735	34.0	53.9	41.1	43.0	76.2	13	20.3	29	55.9	55.9	32.2	.33	.10	28	46	NW.	28	NE.	9,229
Nov	25.623	25.599	25.599	25.607	25.822	4	25.342	24	.480	30.1	45.4	36.0	37.2	69.8	7	− 5.0	22	74.8	48.0	27.6	.31	.21	31	56	NW.	26	W., NW.	9,780
Dec	25.517	25.482	25.515	25.505	25.893	9	25.057	19	.836	2.2	10.9	4.1	5.7	68.4	1	−30.0	22	98.4	18.0	−.6	.82	.30	6	48	W.	2	W.	7,230
Sums	306.592	306.300	306.465	306.452	....	...		...	7.764	385.1	555.4	429.5	456.8	...	....	....	...	736.7	584.1	348.6	9.00	....	....	...	....	....	...	93,104
Means	25.549	25.525	25.539	25.538	25.936	*16	24.908	†10	.647	32.1	46.3	35.8	38.1	88.9	‡10	−30.0	§22	61.3	48.7	29.0	....	....	....	...	....	....	W.	......

* October. † March. ‡ August. § December.

MAGINNIS, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	5	18	1	1	0	18	26	23	1	3.4	7.2	5.2	5.3	54.6	48.5	51.4	51.5	6.3	6.9	5.4	6.2	8	10	13	15	13	31	0	0	0
Feb	17	17	4	3	2	12	14	18	0	−9.6	−1.8	−6.0	−5.8	51.6	49.1	50.1	50.3	5.2	7.0	6.3	6.2	6	13	10	14	18	28	0	0	1
Mar	2	16	10	10	0	11	29	15	0	7.6	13.1	8.1	9.6	52.9	44.8	49.8	49.2	5.4	5.4	5.3	5.4	10	9	12	7	10	29	0	0	0
Apr	0	18	5	12	0	5	24	26	0	14.4	23.5	16.5	18.1	50.9	43.9	48.5	47.8	5.8	5.7	4.2	5.2	8	12	10	10	1	23	0	0	0
May	4	18	0	8	3	23	20	17	0	25.8	39.3	29.9	31.7	49.7	47.7	53.9	50.4	3.5	5.9	4.4	4.6	9	17	5	12	0	3	0	4	0
June ..	0	17	3	6	7	31	18	8	0	36.7	44.4	40.9	40.7	53.9	44.4	56.3	51.5	3.8	5.2	5.1	4.7	10	11	9	13	0	0	0	8	1
July	0	13	6	13	3	27	18	13	0	39.4	44.4	41.6	41.8	62.7	44.1	62.2	56.3	3.6	4.5	4.8	4.3	10	16	5	12	0	0	0	5	1
Aug	0	8	0	10	10	29	18	18	0	42.1	46.9	43.2	44.1	65.7	45.3	62.1	57.7	3.4	3.5	2.9	3.3	19	4	8	7	0	0	0	3	0
Sept	1	21	2	3	0	5	30	28	0	26.2	37.6	30.6	31.5	56.6	51.4	58.2	55.4	6.0	7.2	5.0	6.1	5	12	13	9	0	6	0	0	1
Oct	3	26	1	2	0	14	24	23	0	21.0	33.2	25.1	26.4	58.7	46.5	54.1	53.1	4.6	4.7	3.7	4.3	12	13	6	6	0	17	0	0	0
Nov ...	6	13	1	5	0	5	30	30	0	16.9	26.1	19.7	20.9	57.2	47.7	51.4	52.1	3.2	4.2	3.7	3.7	13	11	6	6	3	21	0	0	0
Dec	1	32	8	1	1	3	33	14	0	−10.6	−3.2	−8.7	−7.5	53.7	52.3	54.9	53.6	5.2	6.1	5.9	5.7	7	12	12	17	22	28	0	0	0
Sums ..	39	217	41	74	26	183	284	233	1	213.3	310.7	246.1	256.8	668.2	565.7	652.9	628.9	56.0	66.3	56.7	59.7	117	140	109	128	67	186	0	20	4
	Percentages.																					Percentages.								
Means.	3.6	19.7	3.8	6.7	2.4	16.7	25.8	21.2	.1	17.8	25.9	20.5	21.4	55.7	47.1	54.4	52.4	4.7	5.5	4.7	5.0	31.9	38.3	29.8	35.0	18.3	50.8	0	5.5	1.1

NOTE.—7 a. m., 3 p m., and 11 p. m., Washington time, correspond to 4 52 a. m., 12.52 p. m., and 8.52 p. m., local time.

Correction for instrumental error of barometer used: From 4.52 a. m., January 1, to 8.52 p. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.77; February, 4.75; March, 4.60; April, 4.50; May, 4.41; June, 4 33; July, 4.31; August, 4.31; September, 4.40; October, 4.54; November, 4.60; December, 4.63.

REMARKS.—Auroras, February 19, June 18, July 25, and September 17; mirages, February 15 and 17; killing frost, July 5.

FRANK BURKE,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MARQUETTE, MICH.

Location of office on December 31, 1884, corner Spring and Front streets.

[Latitude, 46° 34′ N.; longitude, 87° 24′ W. Elevation of barometer above sea-level, 673 feet. Elevation of exposed thermometer above ground, 36 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.335	29.30	29.325	29.323	29.892	26	28.559	30	1.333	7.4	15.3	9.9	10.9	44.5	17	—19.0	24	63.5	20.0	—0.5	.91	.29	13	32	NW., SW.	3 17	W.	7,067
Feb	29.327	29.309	29.312	29.316	29.847	10	28.690	19	1.157	6.6	14.9	8.9	10.1	38.8	19	—20.0	15	58.8	20.3	—3.0	2.05	.48	12	34	S.	19	NW.	5,567
Mar	29.298	29.272	29.290	29.287	29.764	30	28.346	11	1.418	17.2	28.9	22.0	22.7	56.0	24	—16.0	1	72.0	32.0	9.1	.74	.85	10, 11	28	N.	28	N., W., NW.	5,346
Apr	29.308	29.280	29.286	29.291	29.905	21	28.592	27	1.313	33.0	39.5	34.3	35.6	69.0	26	17.9	1	51.1	42.9	25.3	3.94	1.96	14, 15	36	NW.	27	NW.	6,419
May	29.224	29.213	29.216	29.218	29.717	28	28.827	18	.890	45.7	51.1	44.8	47.2	72.5	30	31.2	2	41.3	54.6	37.8	2.43	.68	18, 19	28	NW.	10 15	NW.	5,345
June	29.359	29.329	29.323	29.337	29.681	14	29.052	7	.629	57.2	64.1	57.7	59.7	91.0	29	37.4	10	53.6	71.1	48.1	1.21	.40	1	24	W., NW.	11 24	N.	3,974
July	29.167	29.173	29.165	29.168	29.440	7	28.695	5	.745	58.4	63.9	57.5	59.9	86.0	22	43.1	8	42.9	68.2	51.9	2.45	.63	5	28	W.	5	W.	4,826
Aug	29.258	29.242	29.242	29.247	29.625	9	28.873	3	.752	60.0	68.2	60.8	63.0	90.0	20	38.8	8	51.2	73.0	53.9	5.46	2.28	29	26	NW., SE.,	4 27	NW., SW.	5,804
Sept	29.207	29.199	29.210	29.208	29.776	13	28.665	24	1.111	56.4	65.2	57.9	59.8	88.8	6	38.0	22	50.8	69.5	51.8	4.91	1.69	23, 24	29	W.	16	SW.	6,769
Oct*	29.299	29.273	29.291	29.288	29.831	14	28.746	5	1.085	44.6	52.3	45.8	47.6	82.0	19	20.3	23	61.7	56.7	38.2	5.92	2.60	2	35	SW.	15	NW.	8,110
Nov	29.275	29.247	29.276	29.266	29.644	17	28.742	26	.902	28.6	35.2	30.2	31.8	64.0	14	—6.3	24	70.3	38.3	22.7	2.77	1.14	22, 23	36	SW.	6	W.	8,390
Dec	29.288	29.293	29.298	29.293	29.866	25	28.787	7	1.079	19.1	22.7	19.4	20.4	47.0	3, 4	—15.9	17	62.9	26.8	11.4	8.65	2.18	6, 7	28	NW.	9	W.	7,521
Sums	351.846	351.139	351.243	351.242	......	...	......	..	12.414	434.2	521.3	449.2	468.2	..	..	......	...	680.1	573.4	346.7	41.44	....	......	...	....	....	....	75,188
Means	29.279	29.262	29.270	29.270	29.905	†21	28.346	‡11	1.034	36.2	43.4	37.4	39.0	91.0	§29	—20.0	‖15	56.7	47.8	28.9	.....	....	.....	...	....	....	NW.	......

* One 11 p. m. observation missed.

† April.

‡ March.

§ June.

‖ February.

MARQUETTE, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew point.				Relative humidity (per cent.)				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	5	0	7	11	6	32	21	1	−1.5	.9	1.0	.1	67.3	54.8	67.8	63.3	6.3	6.0	5.6	6.0	7	12	12	14	26	31	0	0	0
Feb	20	5	8	3	10	3	9	27	2	−0.5	3.8	2.3	1.9	72.5	63.5	73.4	69.8	6.6	6.9	5.9	6.5	4	15	10	20	25	29	0	0	1
Mar	16	6	9	6	12	8	16	16	4	10.1	14.1	14.5	12.9	73.9	54.5	72.8	67.1	5.0	4.4	3.4	4.3	10	15	6	9	13	29	0	0	2
Apr	19	6	11	6	10	3	4	27	4	25.0	26.7	24.6	25.4	73.0	62.8	68.2	68.0	5.0	5.1	5.0	5.0	10	10	10	18	1	27	0	2	1
May	19	7	3	17	4	2	11	26	4	36.3	36.2	35.1	35.9	71.9	59.9	71.4	67.7	5.5	5.5	3.3	4.8	10	14	7	14	0	2	0	0	0
June	15	8	14	14	11	8	5	8	7	47.9	45.0	48.5	47.1	72.1	56.0	72.7	66.9	3.6	3.8	3.8	3.7	10	16	4	9	0	0	1	3	1
July	13	6	11	8	7	5	21	19	3	50.3	49.3	49.3	49.6	75.3	60.6	75.2	70.4	3.5	5.4	4.8	4.6	11	13	7	14	0	0	0	1	0
Aug	11	3	5	10	7	19	13	19	6	53.1	52.9	53.9	53.3	78.6	61.1	78.7	72.8	4.0	5.3	4.9	4.7	10	14	7	11	0	0	0	1	0
Sept	9	4	6	7	8	25	15	12	4	48.3	49.6	50.2	49.4	75.1	59.6	76.1	70.3	5.0	5.5	5.5	5.3	7	17	6	15	0	0	0	1	0
Oct	6	5	7	9	9	19	12	24	1	35.7	36.9	36.0	36.2	71.2	58.6	70.2	66.7	5.6	6.3	6.0	6.0	6	13	11	12	1	7	0	0	0
Nov	10	2	4	1	7	10	32	24	0	21.9	23.5	22.6	22.7	75.8	63.8	73.6	71.1	6.6	6.2	5.8	6.2	6	11	13	12	11	24	0	0	0
Dec	9	9	2	2	9	10	27	21	4	13.9	14.6	13.4	14.0	80.3	71.9	78.4	76.9	7.6	8.1	7.6	7.8	2	11	18	22	19	29	0	0	0
Sums	157	66	80	90	105	118	197	244	40	340.5	353.5	351.4	348.5	887.0	727.1	878.5	831.0	64.3	68.5	61.6	64.9	93	161	111	165	96	178	1	6	5
	Percentages.																					Percentages.								
Means	14.3	6.0	7.3	8.2	9.6	10.8	18.0	22.2	3.6	28.4	29.5	29.8	29.1	73.9	60.6	73.2	69.2	5.4	5.7	5.1	5.4	25.5	44.1	30.4	45.1	26.2	48.6	.8	1.6	1.4

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.19 a. m., 2.19 p. m., and 10.19 p. m., local time.

Correction for instrumental error of barometer used: From 6.19 a. m., January 1, to 10.19 p. m., December 31, 1884, inclusive, +.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.780; March, 0.770; April, 0.750; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.720; October, 0.740; November, 0.770; December, 0.780.

F. M. NEAL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MEMPHIS, TENN.

Location of office on December 31, 1884, No. 260 Front street.

[Latitude, 35° 9′ N.; longitude, 90° 3′ W. Elevation of barometer above sea-level 321 feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 51 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only). Washington time. 7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Temperature. Washington time. 7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Self-registering thermometers. Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Precipitation. Total amount.	Any 3 consecutive 8-hourly measurements. Largest amount.	Date.	Wind. Maximum hourly velocity during month. Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.	29.924	29.879	29.921	29.908	30.422	5	29.411	31	1.011	28.4	37.4	33.3	33.0	71.0	30	−2.0	6	73.0	41.2	25.0	5.66	1.23	7	28	NW.	10 24	SE.	5,156
Feb	29.742	29.689	29.733	29.721	30.167	15	29.190	19	.977	43.5	52.3	47.7	47.8	72.7	4	18.5	14	54.2	57.1	39.6	9.64	2.41	6	32	W., NW.	22 27	SE.	4,462
Mar	29.691	29.660	29.671	29.674	30.078	9	29.282	25	.796	47.6	57.2	52.8	52.5	75.0	28	26.8	2	48.2	61.1	45.1	5.08	1.29	4, 5	30	W.	1	SE.	4,550
Apr	29.622	29.604	29.605	29.610	29.900	8	29.116	14	.784	54.8	64.7	59.1	59.5	83.0	30	40.5	11	42.5	68.0	51.8	8.60	3.02	14	32	NW.	10	W.	4,067
May* ..	29.667	29.641	29.650	29.653	29.873	2	29.403	5	.470	64.3	76.3	68.2	69.6	86.8	11	54.0	30	32.8	78.4	61.2	6.46	2.72	21, 22	22	SE.	22	S.	3,889
June	29 671	29.643	29.658	29.657	29.858	17	29.452	9	.406	71.5	81.6	73.5	75.5	96.0	22	59.0	10 11	37.0	84.1	68.8	7.26	3.85	2, 3	28	NW.	10	SE.	2,716
July	29.651	29.622	29.634	29.636	29.791	21	29.419	9	.372	77.2	88.3	80.0	81.8	96.5	9	70.0	12 28	26.5	90.7	73.9	2.38	.76	28	30	NW.	15	NW.	3,823
Aug	29.741	29.723	29.734	29.733	29.866	9	29.445	29	.421	72.7	84.8	75.9	77.8	97.0	29	62.0	11	35.0	86.9	70.4	1.27	.75	26	19	NW.	22 27	NW.	3,567
Sept	29.744	29.722	29.738	29.735	29.905	15	29.488	23	.417	70.4	84.5	75.8	76.9	94.0	9	61.0	19	33.0	86.3	69.2	4.29	1.07	24	25	SE.	3	SE.	3,345
Oct	29.830	29.804	29.828	29.821	30.134	23	29.606	26	.528	59.9	74.1	65.0	66.3	92.0	1	36.0	24	56.0	75.5	58.0	2.83	1.47	26, 27	29	NW.	8	NW.	3,620
Nov	29.884	29.800	29.812	29.815	30.243	6	29.249	22	.994	44.5	58.3	50.8	51.2	71.2	2, 3	23.7	24	47.5	61.0	41.4	2.08	1.84	22	28	NW.	4 28 30	W.	3,315
Dec	29.790	29.753	29.790	29.778	30.235	19	29.254	5	.981	37.5	44.6	41.9	41.8	68.1	4	8.1	19	60.0	49.4	33.5	9.14	3.12	29, 30	28	NW.	18	SE.	5,459
Sums ..	356.907	356.540	356.774	356.741	......	...	......	...	8.157	672.8	804.1	724.0	733.2	...	...	......	...	645.7	839.7	637.9	64.69	....	......	...	....	....	....	47,969
Means .	29.742	29.712	29.731	29.728	30.422	†5	29.116	‡14	.680	56.0	67.0	60.3	61.1	97.0	§29	−2.0	†6	45.5	70.0	53.2	.....	.....	.....	...	....	....	NW.	......

*One 11 p. m. observation missed. †January. ‡April. §August.

MEMPHIS, TENN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	River. Highest. Ft.	In.	Date.	Lowest. Ft.	In.	Date.	Range. Ft.	In.	Mean. Ft.	In.
1884.										°	°	°	°																										
Jan ...	7	10	2	21	6	7	12	20	8	24.5	20.4	25.3	26.4	85.5	75.1	73.0	77.9	6.8	6.5	5.5	6.3	3	16	12	14	7	23	0	1	26	9	5	17	7	18	9	2	21	10.8
Feb ...	5	11	1	24	6	5	15	16	4	38.0	41.0	38.5	39.2	84.6	68.0	71.7	74.8	6.9	7.5	5.5	6.6	5	10	14	16	1	6	0	4	35	1	29	19	2	1	15	11	30	7.6
Mar ...	10	12	8	22	2	8	19	13	4	38.9	38.4	37.8	38.4	73.9	54.7	59.9	62.8	5.9	5.8	4.7	5.5	8	13	10	13	0	4	0	3	35	1	1–3	31	3	16, 17	3	10	33	3.4
Apr ...	3	4	13	14	4	5	21	20	6	47.8	44.8	41.9	45.5	79.3	51.8	60.4	63.8	6.0	6.0	5.4	5.8	7	12	11	11	0	0	0	4	34	0	2	30	5	30	3	7	32	5.7
May ...	7	11	3	14	15	8	13	13	8	57.3	55.7	58.9	57.3	78.7	50.9	73.1	67.6	5.0	6.1	4.2	5.1	8	14	8	10	0	0	0	7	30	2	1	17	6	31	12	8	26	2.9
June ...	3	10	13	15	3	1	10	14	21	66.8	66.8	68.0	67.2	85.5	64.0	83.6	77.7	6.8	6.6	5.1	6.0	5	16	9	14	0	0	7	7	20	7	19–22	15	9	5, 6, 7	4	10	18	3.7
July ...	1	12	5	7	6	14	19	24	5	70.8	71.0	72.5	71.4	81.1	57.6	78.4	72.4	4.8	6.2	5.0	5.3	5	19	7	7	0	0	15	5	17	9	1	10	10	30	6	11	15	6.4
Aug ...	9	8	8	13	5	8	8	31	3	66.5	64.3	66.7	65.8	81.1	51.5	73.7	68.8	3.5	5.2	4.1	4.3	11	14	6	4	0	0	9	7	13	5	5–7	5	1	31	8	4	9	8.8
Sept...	1	14	2	30	8	9	8	16	2	65.2	65.1	67.1	65.8	84.0	54.0	75.1	71.0	4.6	5.3	4.3	4.7	11	11	8	8	0	0	7	6	8	4	7	8	4	22, 26	5	0	5	0.6
Oct ..	2	7	3	15	1	9	10	33	7	55.7	55.4	57.5	56.2	86.4	54.2	77.6	72.7	3.9	4.0	2.5	3.5	18	7	6	6	0	0	1	1	14	1	7	5	9	1	8	4	11	5.3
Nov ...	3	2	5	12	10	12	20	17	9	40.2	42.0	42.3	41.5	85.1	56.6	73.1	71.6	3.9	3.7	2.2	3.3	15	12	8	8	0	3	0	0	10	7	1	5	3	26, 27	5	4	7	7.7
Dec ...	10	8	18	22	3	2	13	12	5	33.1	35.6	35.7	34.8	84.2	72.7	79.1	78.7	7.1	8.6	6.7	7.5	2	12	17	16	3	12	0	1	13	5	31	4	1	11, 12	9	4	7	7.4
Sums.	61	100	81	209	69	83	174	229	82	604.8	609.5	614.2	609.5	989.4	711.1	878.7	859.8	64.7	71.5	55.2	63.9	98	156	111	127	11	48	39	46	......		......	......		......	93	3	219	9.9
	Percentages.																					Percentages.																	
Means.	5.6	0.9	7.4	19.1	6.3	7.6	15.9	20.9	7.5	50.4	50.8	51.2	50.8	82.4	59.3	73.2	71.6	5.4	6.0	4.6	5.3	26.8	42.7	30.4	34.7	3.0	13.1	10.7	12.6	35	1	*29 †1–3	8	4	‡22 ‡26	7	9.2	18	8.8

* February. † March. ‡ September.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.08 a. m., 2.08 p. m., and 10.08 p. m. local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +0.18 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.360; February, 0.350; March, 0.350; April, 0.340; May, 0.330; June, 0.330; July, 0.330; August, 0.330; September, 0.340; October, 0.340; November, 0.350; December, 0.360.

REMARKS.—January 6, lowest temperature on record—2°; January 7, heaviest snow-storm on record, 9.65 inches; January 28, snow disappeared. The floods and Buffalo gnats in spring did great destruction, the former to lives, stock, and property, the latter to stock. Rosy sunsets and long twilights in spring and fall; earthquake shock about 11.15 p. m., November 29; first snow December 17; last snow March 4; first frost (killing) October 24; last frost (light) April 25; last frost (killing) March 10; frost October 24 was very destructive.

D. T. FLANNERY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MOBILE, ALA.

Location of office on December 31, 1884, United States Custom-house.

[Latitude, 30° 41′ N.; longitude, 88° 2′ W. Elevation of barometer above sea-level, 35 feet. Elevation of exposed thermometer above ground, 87 feet. Elevation of rain-gauge above ground, 81 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan......	30.232	30.182	30.224	30.213	30.672	21	29.811	18	.861	38.3	48.9	43.3	43.5	67.0	11 31	13.9	6	53.1	52.7	34.3	7.40	2.83	23, 24	24	N.	24	N.	5,143
Feb......	30.094	30.048	30.085	30.076	30.371	15	29.699	27	.672	32.1	64.1	55.7	57.3	75.5	11	28.9	29	46.6	66.2	49.7	5.01	2.05	16, 17	28	N.	20	S.	4,564
Mar	30.035	29.907	30.026	30.019	30.332	15	29.748	1	.584	56.6	68.7	61.2	62.2	83.9	28	37.0	1	46.9	71.0	54.4	11.53	4.30	17, 18	26	SW.	18	S.	5,061
Apr	29.967	29.926	29.947	29.947	30.159	9	29.648	5	.511	60.1	74.3	64.1	66.2	85.9	19	43.0	24	42.9	76.4	58.5	5.54	2.40	20, 21	28	NE.	5	S.	4,943
May	29.981	29.949	29.965	29.965	30.147	23	29.781	26	.366	69.7	82.3	71.8	74.6	92.7	24	58.7	9	34.0	86.1	67.4	8.48	2.20	4, 5	16	S., SW.	21 26	S.	3,977
June	29.964	29.931	29.952	29.949	30.139	1	29.731	10	.408	72.9	85.4	75.2	77.8	96.0	20 21	61.7	12	34.3	88.7	69.8	7.01	1.13	4, 5	21	NW.	24	N.	3,606
July	29.978	29.955	29.966	29.966	30.112	24	29.793	10	.319	76.8	84.6	78.8	80.1	95.6	21	69.5	8 24	26.1	89.7	73.7	4.96	.92	13	28	SE.	6	SW.	4,837
Aug	30.026	29.982	30.015	30.008	30.164	20	29.824	31	.340	72.8	85.6	77.7	78.7	95.9	29	63.0	7	32.9	88.9	71.2	1.26	.66	18	23	NE.	16	NW.	4,188
Sept.....	30.040	30.001	30.034	30.025	30.200	15	29.858	1	.342	78.0	84.4	77.5	78.3	94.4	12	61.1	16	33.3	87.5	71.0	1.78	.91	5, 6	24	SE.	23	N., S.	4,498
Oct	30.097	30.045	30.085	30.076	30.352	24	29.877	9	.475	66.4	80.6	69.7	72.2	93.4	8	43.7	24	49.7	82.5	63.6	5.36	2.19	26, 27	29	SE.	27	N.	4,310
Nov	30.127	30.078	30.119	30.108	30.373	6	29.614	28	.759	47.6	65.0	53.8	55.5	78.7	3	34.1	25	44.6	67.2	44.7	4.12	1.84	27, 28	28	SE.	23	N.	4,289
Dec......	30.100	30.059	30.099	30.086	30.410	19	29.645	5	.765	40.7	59.5	52.6	53.9	78.8	22	20.2	19	58.5	62.5	45.0	5.10	1.25	14	24	SE., NW.	11 18	SE.	5,236
Sums ..	360.641	360.153	360.517	360.438	......	...	....	...	6.402	736.0	883.4	781.4	800.3	....		......	...	502.9	919.4	703.3	67.55	...	......	...	....	....	....	54,742
Means .	30.053	30.013	30.043	30.036	30.672	*21	29.614	†28	.534	61.3	73.6	65.1	66.7	96.0	‡20 ‡21	13.9	*6	41.9	76.6	58.6	.....	....	......	...	....	....	N.	......

* January. † November. ‡ June.

MOBILE, ALA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—							River.					
										Washington time.																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																	Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan	41	8	4	2	19	3	1	10	5	33.0	36.6	36.5	35.4	81.2	65.1	77.6	74.6	6.7	5.5	5.1	5.8	6	11	14	16	0	13	0	0	15 8	18	12 0	5	3 8	14 2
Feb	21	3	1	3	32	6	2	6	13	47.2	48.8	48.6	48.2	83.9	61.0	78.7	74.5	4.6	4.6	3.7	4.3	10	12	7	11	0	2	0	1	16 8	19	14 1	20	2 7	15 4
Mar	20	7	5	2	32	16	4	5	2	51.0	51.0	55.0	52.3	82.8	57.7	81.5	74.0	6.3	4.8	5.2	5.3	11	8	12	13	0	0	0	5	17 4	18	14 0	10	3 4	16 1
Apr	15	5	2	7	32	5	6	17	1	54.4	53.4	56.6	54.8	82.0	51.5	77.3	70.3	5.5	3.7	4.1	4.4	10	15	5	11	0	0	0	2	17 4	14	14 11	9	2 5	16 4
May	22	5	3	8	26	15	7	4	3	65.0	64.8	64.9	64.9	85.3	57.8	80.0	74.4	5.6	5.3	2.1	4.3	12	14	5	11	0	0	5	9	17 0	27	15 9	18	1 3	16 3
June	20	9	9	5	17	11	12	6	1	68.0	67.6	68.4	68.0	84.8	57.3	80.3	74.1	6.0	6.8	3.3	5.4	7	16	7	16	0	0	10	9	17 4	9	15 0	{16 17 30}	2 4	16 2
July	11	2	4	4	18	22	16	13	3	73.1	71.6	72.3	72.3	88.5	67.7	81.3	79.2	5.0	7.0	3.1	5.0	5	22	4	13	0	0	15	10	16 11	23, 27	15 0	{4 15 17}	1 11	16 1
Aug	17	8	5	10	11	12	4	23	3	69.1	66.1	70.1	68.4	88.5	54.4	77.9	73.6	3.5	5.8	2.8	4.0	12	15	4	6	0	0	15	4	18 0	19	15 10	14	2 2	16 11
Sept	16	15	11	14	16	4	2	10	2	69.5	67.3	70.3	69.0	89.2	58.7	79.0	75.6	1.8	3.9	0.7	2.1	24	6	0	5	0	0	4	3	18 1	6	15 10	12	2 3	17 2
Oct	23	15	8	8	10	3	4	14	8	61.1	59.5	62.6	61.1	83.9	51.3	79.3	71.5	2.3	3.5	1.5	2.4	22	6	3	6	0	0	7	0	18 2	27	15 7	9	2 7	16 9
Nov	41	5	1	10	3	1	2	19	8	45.8	51.8	48.9	48.8	93.5	66.9	85.0	81.8	2.3	3.3	2.6	2.7	18	9	3	9	0	0	0	0	16 6	1, 2	14 4	7	2 2	15 7
Dec	17	6	12	22	9	3	1	16	7	46.7	50.3	48.3	48.4	89.9	74.5	86.0	83.5	5.8	5.9	5.3	5.7	9	10	12	13	0	3	0	1	17 2	5	13 0	19	4 2	14 9
Sums ..	264	88	65	95	225	101	61	143	56	683.9	688.8	702.5	691.6	1,033.5	723.9	963.9	907.1	55.4	60.1	39.5	51.4	146	144	76	130	0	18	56	44	....	.....	....	....	30 10	191 7
	Percentages.																					Percentages.													
Means .	24.0	8.0	5.9	8.6	20.5	9.2	5.6	13.0	5.1	57.0	57.4	58.5	57.6	86.1	60.3	80.3	75.6	4.6	5.0	3.3	4.3	39.9	39.3	20.8	35.5	0	4.9	15.3	12	18 2	*27	12 0	†5	2 6.8	15 11.6

* October. † January.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.16 a. m., 2.16 p. m., and 10.16 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.019 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—Office moved from Manser Building to Custom-house July 1, 1884. The barometers are 6 feet lower than at former office and the thermometers are 51.75 feet higher. Rain-gauge 30.48 feet higher than at former office. No change in correction for elevation. Severe drought during September and October.

WES. BLAKE,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MONTGOMERY, ALA.

Location of office on December 31, 1884, No. 10 Market street.

[Latitude, 32° 23′ N.; longitude, 86° 18′ W. Elevation of barometer above sea-level, 219 feet. Elevation of exposed thermometer above ground, 34 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.049	29.997	30.028	30.025	30.453	21	29.587	14	.866	35.4	45.5	40.5	40.5	70.5	31	8.0	6	62.5	50.0	31.6	4.82	1.19	18	22	W., SW.	2 31	NW.	3,891
Feb	29.914	29.857	29.886	29.886	30.189	15	29.427	27	.762	48.4	63.3	54.5	55.4	80.9	19	22.0	29	58.9	65.9	46.2	4.80	2.73	16, 17	32	SW., NW.	19	S.	4,408
Mar	29.844	29.801	29.827	29.824	30.140	10	29.465	1	.675	53.2	67.0	59.5	59.9	82.8	28	32.0	1	50.8	68.9	50.9	9.50	3.05	23, 24	28	W.	1	SE.	5,127
Apr	29.769	29.722	29.745	29.745	29.978	29	29.422	14	.556	56.8	71.3	62.2	63.4	85.3	29	42.6	10	42.7	73.0	54.2	3.08	1.68	19	30	SW.	2	NW.	4,569
May	29.791	29.739	29.763	29.764	29.970	23	29.551	26	.419	68.0	83.2	72.7	74.6	93.1	22	59.4	10	33.7	85.2	65.3	1.18	.48	20	20	SW., SE.	20 22	SW.	3,801
June	29.783	29.734	29.763	29.761	29.983	1	29.501	10	.482	70.9	83.0	73.0	75.6	94.1	20	59.8	1	34.3	85.0	68.0	10.26	3.62	30	28	N.	13	SE.	3,797
July	29.771	29.725	29.740	29.747	29.901	23	29.571	9	.330	76.2	88.2	78.6	81.0	94.8	13	65.6	8	29.2	90.9	72.8	2.80	1.09	28, 29	23	NW.	27	SW.	3,872
Aug	29.841	29.787	29.814	29.814	29.980	20	29.608	29	.372	71.6	86.9	76.8	78.4	97.1	29	62.2	6	34.9	88.8	69.5	3.05	1.12	2	27	NE.	4	NE.	2,829
Sept	29.875	29.805	29.844	29.841	30.062	15	29.683	12	.379	70.9	88.3	77.7	79.0	97.0	12	58.0	17	39.0	89.5	68.7	.58	.44	6	16	SE., NE.	3 14 15	NE.	3,130
Oct	29.938	29.860	29.901	29.900	30.184	25	29.680	8	.504	63.0	81.8	69.7	71.5	96.1	7	40.0	24, 25	56.1	83.0	61.3	1.87	1.82	27	20	SE.	27	NE.	3,643
Nov	29.934	29.880	29.919	29.911	30.198	6	29.342	28	.856	45.9	64.0	52.0	54.0	77.7	13	32.1	25	45.6	66.6	42.6	2.67	1.25	22, 23	24	W.	28	NW.	3,016
Dec	29.921	29.888	29.910	29.909	30.214	10	29.448	5	.766	46.1	57.1	50.4	51.2	77.1	22	16.0	19	61.1	60.8	41.5	4.00	1.43	14	22	W., NW.	6 18	SE.	4,636
Sums ..	358.182	357.795	358.155	358.127	......	...	......	...	6.967	706.4	879.6	767.6	784.5	....	....	....	....	548.8	907.1	672.6	48.61	...	......	...	....	....	....	46,219
Means .	29.849	29.816	29.846	29.844	30.453	*21	29.342	†28	.581	58.9	73.3	64.0	65.4	97.1	‡29	8.0	*6	45.7	75.6	56.0	.....	.....	......	...	....	....	NW.	......

* January. † November. ‡ August.

MONTGOMERY, ALA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On whi ch .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	12	4	7	10	6	7	4	21	22	30.8	32.5	34.1	32.5	82.9	61.7	76.3	73.6	6.2	6.2	5.0	5.8	6	12	13	15	1	17	0	0	0
Feb	9	4	9	4	19	14	3	14	11	43.4	42.4	45.6	43.8	88.1	50.0	78.3	68.8	5.6	4.9	3.8	4.8	9	14	6	12	0	8	0	3	0
Mar	5	9	1	23	11	18	7	19	0	47.6	46.0	48.9	47.5	82.3	51.1	70.4	67.9	6.1	5.8	3.9	5.3	12	8	11	14	0	0	0	4	0
Apr	7	2	3	9	15	14	17	22	1	50.0	47.1	50.6	49.2	78.7	45.8	67.1	63.9	5.0	5.5	4.7	5.1	10	9	11	10	0	0	0	4	0
May	6	6	5	12	12	22	7	20	3	60.8	57.1	61.1	59.7	78.3	42.6	68.0	63.0	5.0	4.6	2.7	4.1	11	16	4	8	0	0	2	4	0
June	1	12	18	24	12	11	6	3	3	66.5	65.7	67.7	66.6	86.8	58.2	84.8	76.4	6.3	6.5	4.9	5.9	5	14	11	19	0	0	8	12	0
July	12	5	0	8	12	30	12	11	3	72.8	70.6	72.4	71.8	88.0	57.9	81.7	75.9	3.9	3.9	3.6	3.8	15	12	4	11	0	0	19	4	0
Aug	10	21	4	16	6	6	8	12	10	68.6	66.4	69.0	68.0	90.8	51.6	77.6	73.3	3.9	4.8	2.0	3.6	14	15	2	11	0	0	11	3	0
Sept	5	23	14	22	11	4	2	5	4	65.8	62.6	65.7	64.7	84.3	43.8	67.3	65.1	1.9	3.3	2.3	2.5	17	13	0	2	0	0	14	0	0
Oct	8	30	9	16	0	6	1	18	5	55.5	52.2	57.0	54.9	77.9	39.3	65.6	60.9	2.7	3.5	1.7	2.6	22	4	5	4	0	0	8	0	0
Nov	13	16	7	5	1	6	6	24	12	41.5	39.0	43.8	41.4	85.4	43.0	74.3	67.6	4.8	4.0	2.7	3.8	15	10	5	8	0	0	0	0	0
Dec	9	13	10	20	6	5	4	19	7	41.5	43.8	43.7	43.0	84.5	64.4	78.9	75.9	7.8	5.8	5.4	6.3	5	12	14	12	0	4	0	0	0
Sums	97	145	87	169	111	143	77	188	81	644.8	625.4	659.6	643.1	1,003.0	609.4	884.8	832.3	59.2	58.8	42.7	53.6	141	139	86	126	1	24	62	34	0
	Percentages.																					Percentages.								
Means	8.9	13.2	7.9	15.4	10.1	13.0	7.0	17.1	7.4	53.7	52.1	55.0	53.6	83.6	50.8	73.7	69.4	4.9	4.9	3.6	4.5	38.5	38.0	23.5	34.4	0.3	6.6	16.9	9.3	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time.

Correction for instrumental error of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, .000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.24; February, 0.24; March, 0.24; April, 0.23; May, 0.23; June, 0.23; July, 0.22; August, 0.23; September, 0.23; October, 0.23; November, 0.24; December, 0.24.

REMARKS.—First light frost observed October 17; first killing frost observed November 7.

P. T. JENKINS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued

MOORHEAD, MINN.

Location of office on December 31, 1884, corner Front and Sixth streets.

[Latitude, 46° 52′ N.; longitude, 96° 44′ W. Elevation of barometer above sea-level, 923 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 41 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.129	29.134	29.150	29.141	29.757	4	28.396	13	1.361	− 9.4	2.7	−3.7	−3.5	43.0	17	−43.0	4	86.0	9.0	−16.1	.55	.20	24, 25	40	S.	24	N.	7,418
Feb	29.101	29.085	29.093	29.093	29.670	11	28.259	18	1.411	−10.1	2.2	−3.7	−3.9	37.0	25	−30.0	{7 {28	67.0	7.6	−15.2	1.82	.21	18, 19	56	SE.	24	N.	6,680
Mar	28.998	29.016	29.006	29.007	29.367	29	28.290	11	1.077	7.2	21.8	15.2	14.7	53.0	27	−23.0	3	76.0	26.2	4.0	1.03	.54	11	44	N.	2	N.	6,055
Apr	29.016	28.989	29.010	29.005	29.575	20	28.469	29	1.106	33.2	45.6	38.0	38.9	67.5	24	17.0	7	50.5	49.0	30.5	1.23	.74	28, 29	32	SE.	29	N.	6,413
May	28.980	28.950	28.951	28.960	29.310	29	28.606	19	.704	45.5	64.3	53.5	54.4	85.5	17	28.5	2	57.0	67.0	42.6	1.75	.92	22	30	N.	{8 {18	N.	7,603
June ...	28.968	28.944	28.952	28.965	29.153	26	28.675	11	.478	61.8	79.0	67.1	69.3	91.0	20	39.0	9	52.0	81.8	57.4	1.84	.52	17	39	S.	27	S.	8,632
July	28.936	28.916	28.918	28.923	29.187	19	28.694	4	.493	57.0	72.6	62.3	64.0	83.4	9	43.0	13	40.4	75.4	53.1	7.32	1.95	8	28	NW.	22	N.	4,723
Aug	28.955	28.939	28.938	28.944	29.304	8	28.554	19	.750	56.2	74.5	62.2	64.3	87.8	11	41.9	21	45.9	76.9	54.8	6.17	2.57	19	34	N.	20	S.	7,868
Sept	28.884	28.852	28.881	28.873	29.281	19	28.370	2	.911	49.9	66.0	55.6	57.2	84.0	5	36.2	20	47.8	68.4	48.1	2.49	.85	8	40	S.	13	S.	7,906
Oct	29.000	28.971	28.980	28.984	29.414	23	28.290	5	1.124	37.2	52.5	43.8	44.8	77.7	2	14.9	23	62.8	56.0	35.0	3.70	2.57	4, 5	45	S.	25	S.	9,843
Nov	29.086	29.069	29.089	29.081	29.495	5	28.557	26	.938	20.8	32.0	23.7	25.3	56.3	12	−15.0	28	71.3	35.1	16.3	.84	.15	1	32	NW.	19	S.	7,150
Dec	29.101	29.106	29.138	29.115	29.657	25	28.484	3	1.173	3.7	9.3	5.0	6.0	49.0	2	−31.0	25	80.0	13.5	− 2.1	.76	.14	21, 30	43	S.	25	N.	8,104
Sums ..	348.154	347.971	348.118	348.081	....	...	....	...	11.526	352.5	522.5	418.5	431.0	....	....	....	...	736.7	565.9	307.9	28.50	....	......	...	......	....	......	87,890
Means .	29.013	28.998	29.010	29.007	29.757	*4	28.259	†18	.960	29.4	43.5	34.9	35.9	91.0	‡20	−43.0	*4	61.4	47.2	25.7	.....	....	......	...	......	....	N.	......

* January. † February. ‡ June.

MOORHEAD, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	34	2	0	10	16	9	4	10	8	—10.9	—0.7	—6.5	—6.0	94.0	86.7	88.6	89.8	4.4	5.8	2.7	4.1	12	16	8	6	27	31	0	0	0
Feb	39	7	1	9	10	3	4	12	2	—11.8	—1.8	—7.2	—6.8	95.3	82.6	84.3	87.4	4.1	6.5	5.2	5.3	8	12	9	15	27	29	0	0	0
Mar	20	5	3	15	14	7	12	13	4	4.1	17.1	11.7	11.0	87.4	81.5	86.1	85.0	4.9	6.5	4.2	5.2	8	15	8	5	18	29	0	0	0
Apr	37	6	4	12	14	4	1	8	9	27.4	29.0	29.9	28.8	79.2	56.9	78.3	69.8	5.9	6.0	4.8	5.6	9	9	12	8	0	19	0	0	0
May	26	16	2	11	14	11	7	5	1	38.5	38.3	40.1	39.0	77.6	43.4	62.6	61.2	5.0	6.2	3.8	5.0	9	16	6	6	0	2	0	1	0
June	8	11	3	14	44	3	2	1	4	56.4	57.7	57.4	57.2	82.0	49.2	71.6	67.8	5.3	5.9	3.5	4.9	7	17	6	7	0	0	2	6	2
July	23	7	4	9	20	6	7	15	2	52.5	55.1	55.9	54.5	85.0	55.5	79.2	73.2	4.6	7.9	4.0	5.5	6	18	7	12	0	0	0	14	2
Aug	17	6	4	7	36	5	8	13	2	53.1	54.7	56.2	54.7	89.1	51.6	81.1	73.9	4.4	6.4	2.5	4.4	8	19	4	7	0	0	0	3	0
Sept	17	5	6	11	18	5	14	11	3	45.3	45.9	47.6	46.3	84.6	51.2	75.2	70.3	4.7	7.5	4.9	5.7	5	17	8	11	0	0	0	4	2
Oct	16	3	2	13	25	6	11	15	2	31.6	32.0	33.7	32.4	80.0	47.9	69.4	65.8	5.5	6.1	3.8	5.1	8	15	8	9	2	13	0	2	2
Nov	23	6	3	2	25	9	4	17	1	16.6	22.2	18.5	19.1	85.6	68.0	81.1	78.2	4.7	6.2	4.6	5.2	9	12	9	7	13	27	0	0	1
Dec	27	2	1	2	23	7	11	18	2	1.0	6.3	1.2	2.8	85.0	85.1	84.7	84.9	5.7	6.8	6.2	6.2	6	13	12	12	24	30	0	0	1
Sums	287	76	33	115	259	75	80	133	40	304.3	355.8	338.5	333.0	1023.4	759.6	937.2	907.3	59.2	77.3	50.2	62.2	95	179	92	105	111	180	2	30	10
	Percentages.																					Percentages.								
Means	26.1	6.9	3.0	10.5	23.6	6.8	7.3	12.1	3.6	25.4	29.6	28.2	27.7	85.4	63.3	78.1	75.6	4.9	6.4	4.2	5.2	26.0	48.9	25.1	28.7	30.3	49.2	.6	8.2	2.7

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 6, inclusive, +.004 inch; from 7 p. m., August 6, to 11 p. m., December 31, 1884, inclusive, —.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.11; February, 1.10; March, 1.08; April, 1.03; May, 0.98; June, 0.97; July, 0.96; August, 0.97; September 0.99; October, 1.02; November, 1.06; December, 1.11.

REMARKS.—Extra barometer substituted for station barometer August 6; hence change in "instrumental error."

L. M. DEY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MOUNT WASHINGTON, N. H.

Location of office on December 31, 1884, Signal office, summit.

[Latitude, 44° 16′ N.; longitude, 71° 18′ W. Elevation of barometer above sea-level, 6,279 feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*n.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	23.384	23.364	23.363	23.370	23.944	27	22.662	2	1.282	4.2	6.8	4.6	5.2	36.0	24	—29.0	6	65.0	14.5	—5.1	2.45	.41	1, 2	130	NW.	10	NW.	*28,310
Feb	23.515	23.469	23.483	23.489	23.905	16	22.468	29	1.527	14.5	15.7	12.1	14.1	39.0	14	—30.2	29	69.2	23.5	2.1	7.55	1.93	13, 14	130	SE.	20	NW.	*24,810
Mar	23.445	23.432	23.453	23.443	23.891	18	22.824	1	1.067	11.1	14.0	11.4	12.2	41.6	12	—26.0	1	67.6	19.8	2.5	4.16	1.26	12	122	SW.	12	NW.	*24,525
Apr	23.481	23.495	23.498	23.491	23.889	27	22.778	4	1.111	23.9	27.5	24.7	25.4	45.2	27	1.8	1	43.4	30.6	18.1	3.29	.72	15, 16	92	NW.	4	NW.	*15,970
May	23.645	23.656	23.662	23.654	24.084	22	23.154	11	.930	30.3	34.5	31.1	32.0	55.0	26	12.5	29 30	42.5	38.0	25.4	9.54	2.95	20, 21	100	W.	2	NW.	*19,960
June	23.980	23.971	23.966	23.972	24.274	15	23.653	24	.621	46.8	53.0	47.2	40.0	67.0	17	26.5	14	40.5	55.3	42.1	8.08	2.96	9, 10	74	NW.	21	W.	19,090
July	23.730	23.721	23.710	23.720	24.049	4	23.399	14	.650	43.2	47.3	43.3	44.6	66.8	1	30.0	25	36.8	50.1	39.3	23.90	4.94	14, 15	96	NW.	24	NW.	25,815
Aug	23.968	23.956	23.954	23.959	24.167	16 17	23.662	1	.505	45.2	51.1	46.9	47.7	65.0	19	21.6	25	43.4	53.8	41.5	8.63	2.70	29, 30	88	SE.	29	NW.	20,870
Sept	23.883	23.878	23.873	23.878	24.181	26	23.493	16	.688	39.6	43.6	41.0	41.4	63.0	4	13.5	14	49.5	46.6	34.6	7.58	1.14	7, 8 28, 29	96	NW.	20	NW.	*29,335
Oct	23.735	23.720	23.728	23.728	24.096	26	23.350	17	.746	27.2	30.1	27.9	28.4	56.4	4, 5	4.3	26	52.1	36.2	20.9	12.91	3.95	4	92	NW.	20	NW.	*25,475
Nov	23.509	23.516	23.512	23.512	23.970	22	22.950	24	1.020	15.8	17.6	16.9	16.8	37.1	5	— 8.9	6 25	46.0	24.4	8.4	7.99	3.30	23, 24	128	S.	23	NW.	*23,690
Dec	23.509	23.509	23.499	23.506	24.181	29	22.964	7	1.167	10.2	12.7	12.7	11.9	43.0	31	—42.2	19	85.2	21.2	4.2	4.70	.91	30	96	NW.	19	NW.	*11,410
Sums	283.784	283.687	283.701	283.722	....	...	....	...	11.814	312.0	353.9	319.8	328.7	....	....	......	...	641.2	414.0	234.0	100.78	....	......	...	....	...	....	*269,260
Means	23.649	23.641	23.642	23.644	24.274	†15	22.468	‡29	.943	26.0	29.5	26.6	27.4	67.0	†17	—42.2	§19	53.4	34.5	19.5	......	....	......	...	....	...	NW.	....

* Insufficient, owing to frost-work, &c. † June. ‡ February. § December.

MOUNT WASHINGTON, N. H.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	1	0	0	5	0	16	11	58	2	1.5	3.3	1.9	2.2	80.8	79.3	82.6	80.9	4.2	3.6	4.0	3.9	12	14	5	16	30	31	0	0	0
Feb	0	0	1	6	7	9	19	43	2	11.0	12.8	9.0	10.9	86.7	89.1	87.9	87.9	3.9	5.1	2.8	3.9	9	17	3	22	28	29	0	0	0
Mar	5	3	5	3	6	7	17	45	2	6.7	11.3	7.9	8.6	83.1	88.9	86.2	86.1	5.4	4.3	3.7	4.5	10	15	6	20	23	31	0	0	3
Apr	13	15	9	5	3	5	3	36	1	21.5	25.5	22.9	23.3	90.7	92.3	92.7	91.9	3.1	2.5	2.6	2.7	19	8	3	12	14	30	0	0	1
May	4	2	6	6	6	9	13	47	0	28.9	32.4	29.9	30.4	94.7	92.5	95.3	94.2	4.6	5.7	3.9	4.7	7	19	5	19	7	22	0	0	1
June	4	8	3	0	1	10	37	26	1	39.1	44.8	41.1	41.7	77.9	75.5	81.2	78.2	2.9	4.3	1.7	3.0	16	12	2	13	0	3	0	4	0
July	1	4	2	7	4	11	26	37	1	41.3	45.2	42.2	42.9	93.7	93.1	96.2	94.3	4.7	4.7	4.7	4.7	8	16	7	22	0	1	0	1	3
Aug	2	7	4	3	9	20	23	24	1	42.5	47.2	45.0	44.9	91.0	87.4	93.5	90.6	3.2	5.0	2.7	3.6	13	13	5	16	0	3	0	6	0
Sept	0	0	0	0	5	9	35	40	1	38.9	41.1	39.9	40.0	97.5	91.5	95.8	94.9	1.3	3.4	2.5	2.4	18	12	0	17	2	11	0	1	0
Oct	2	2	1	0	4	12	24	48	0	25.4	27.0	26.5	26.3	93.0	89.8	94.6	92.5	3.6	3.1	4.6	3.8	10	15	6	22	10	26	0	0	1
Nov	0	0	0	5	5	12	16	52	0	15.0	16.4	15.7	15.7	96.8	95.3	95.2	95.8	2.8	1.4	3.3	2.5	18	10	2	18	24	30	0	0	0
Dec	6	1	0	2	5	9	24	44	2	11.1	11.8	13.1	12.0	93.1	90.2	95.2	92.8	2.0	2.8	1.3	2.0	19	12	0	12	24	28	0	0	0
Sums	38	42	31	42	55	129	248	500	13	282.9	318.8	295.1	298.9	1,079.0	1,064.9	1,096.4	1,080.1	41.7	45.9	37.8	41.7	159	163	44	209	162	245	0	12	9
	Percentages.																					Percentages.								
Means	3.5	3.8	2.8	3.8	5.0	11.8	22.6	45.5	1.2	23.6	26.6	24.6	24.9	89.9	88.7	91.4	90.0	3.5	3.8	3.2	3.5	43.4	44.5	12.0	57.1	44.3	66.9	0	3.3	2.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.23 a. m., 3.23 p. m., and 11.23 p. m., local time.

Corrections for instrumental error of barometer used: From 7.23 a. m., January 1, to 3.23 p. m. June 13, inclusive, +.009 inch; from 7.23 p. m., June 13, 1884, to 11.23 p. m., December 31, 1884, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.630; February, 6.620; March, 6.520; April, 6.410; May, 6.180; June, 6.120; July, 6.070; August, 6.080; September, 6.150; October, 6.340; November, 6.560; December, —6.630.

REMARKS.—Station barometer No, 1857 broken June 13; extra barometer No. 505 substituted and the first observation taken with it was the 7.23 p. m. (local time), June 13; frosts occurred during each month of the year. The year has been noted for the grandeur of its sunrises and sunsets; all the characteristics which have lately attracted such universal attention have been observed here. On nearly all clear days the copper-colored band around the sun has also been observed.

EDW'D A. BEALS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MYER, FORT, VA.

[Latitude, 38° 53′ N.; longitude 77°, W. Elevation of barometer above sea-level, 267 feet. Elevation of exposed thermometer above ground, 43.67 feet. Elevation of rain-gauge above ground, 1.17 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	8 p. m.	11 p. m.							7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.915	29.860	29.887	29.887	30.606	27	28.945	8	1.661	23.8	31.8	28.3	28.0	51.0	8	3.0	6	48.0	36.8	21.0	5.75	2.60	8	34	NW.	9	NW.	7,187
Feb	29.817	29.792	29.871	29.827	30.468	20	29.064	28	1.404	36.7	44.4	38.3	39.8	[1]71.5	6	7.8	29	63.7	[1]48.2	30.9	6.43	1.11	23	43	NW.	20	NW.	[2]6,258
Mar	29.795	29.733	29.792	29.773	30.184	16	29.241	26	.943	36.2	46.3	39.8	40.8	65.0	12	10.3	1	54.7	49.0	33.2	7.52	1.75	19	44	NW.	30	NW.	[3]7,948
Apr	29.660	29.593	29.655	29.636	29.967	12	28.939	2	1.028	44.0	56.1	48.1	49.4	80.2	28	[4]30.5	6 9	49.7	58.3	[4]41.3	2.29	.97	9	41	NW.	2 18	NW.	8,253
May	29.728	29.670	29.712	29.703	30.063	3	29.401	11	.662	57.3	69.9	59.9	62.4	87.8	23	38.3	29	49.5	72.2	52.8	2.35	.64	5, 6	30	NW.	14	NW.	6,600
June	29.832	29.790	29.801	29.808	30.209	15	29.419	25	.790	64.9	77.9	68.2	70.3	91.8	21	46.6	16	45.2	80.6	60.9	5.88	2.89	13, 14	26	NW.	26	E. & SE.	5,291
July	29.656	29.596	29.630	29.627	29.816	22	29.396	29	.420	67.2	78.9	69.7	71.9	95.2	24	54.9	9	40.3	81.7	63.7	6.92	1.99	28, 20	32	W.	24	NW.	5,618
Aug	29.813	29.771	29.798	29.774	30.040	25	29.453	30	.587	67.7	79.8	69.9	72.5	94.8	20	56.0	13	38.8	81.9	64.4	.90	.28	30, 31	39	NW.	21	NW.	3,907
Sept	29.881	29.821	29.860	29.854	30.223	14	29.505	17	.718	62.6	79.6	67.6	69.9	94.6	9	43.0	15	51.6	81.8	58.4	.43	.40	12	26	SW.	24	S.	4,841
Oct	29.930	29.858	29.901	29.896	30.357	26	29.478	8	.879	52.3	67.4	56.0	58.6	90.6	4	31.0	24	59.6	69.7	48.2	1.61	.66	22	32	SW.	22	NW.	6,399
Nov.. ...	29.863	29.810	29.834	29.836	30.178	3	29.226	28	.952	37.9	51.0	42.4	48.8	72.7	2	20.5	26	52.2	54.3	33.9	3.66	1.74	23	36	S.	23	NW.	6,635
Dec	20.942	29.881	29.914	29.912	30.412	28	29.265	6	1.147	30.4	39.3	34.4	34.7	68.1	31	3.7	19	64.4	42.8	27.7	4.50	1.66	6	42	NW.	9	NW.	6,341
Sums..	357.832	357.175	357.655	357.553	....	...	....	...	11.191	581.0	722.4	622.6	642.1	......	....	......	...	617.7	757.3	536.4	48.24	....	....	...	....	....	....	75,278
Means.	29.819	29.765	29.805	29.796	30.606	[5]27	28.939	[6]2	.933	48.4	60.2	51.9	53.5	95.2	[7]24	3.0	[5]6	51.5	63.1	44.7	.....	....	....	...	....	....	NW.	......

[1] For 27 days. [2] For 25 days. [3] For 30½ days. [4] For 29 days. [5] January. [6] April. [7] July.

MYER, FORT, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	7	12	3	2	4	19	8	26	10	20.5	23.8	23.2	22.5	87.1	74.2	82.3	81.2	6.5	6.9	4.8	6.1	4	16	11	13	7	27	0	0	0
Feb	6	12	9	10	7	9	4	19	11	33.2	32.7	32.5	32.8	88.2	66.6	80.7	78.5	6.6	5.8	5.0	5.8	4	15	10	16	1	15	0	0	0
Mar	1	5	11	14	7	2	7	37	9	31.6	33.5	32.4	32.5	84.8	64.6	76.6	75.2	6.1	7.0	6.0	6.4	6	9	16	19	3	12	0	1	0
Apr	4	9	4	7	6	8	4	38	10	34.8	34.6	36.9	35.4	71.8	49.6	67.1	62.8	5.1	6.2	5.1	5.5	9	11	10	7	0	2	0	1	1
May	5	5	9	10	12	10	10	24	8	49.6	50.0	51.0	50.2	77.2	52.4	74.8	68.0	4.1	4.5	5.1	4.6	9	14	8	14	0	0	0	3	0
June	1	12	16	16	11	7	4	12	11	60.2	61.5	62.1	61.3	85.0	59.7	81.1	75.3	5.3	4.9	4.3	4.8	10	18	7	8	0	0	2	4	0
July	5	2	8	3	10	18	10	30	7	61.9	63.3	62.6	62.6	84.0	61.3	80.1	75.1	4.9	5.6	4.4	5.0	6	21	4	12	0	0	2	6	0
Aug	7	2	6	6	10	8	8	22	24	64.1	63.8	64.8	64.2	88.5	60.4	84.4	77.8	5.0	4.9	3.8	4.6	9	18	4	7	0	0	3	1	0
Sept	7	6	3	6	19	27	0	11	11	57.8	57.8	58.8	58.1	85.0	49.0	74.9	69.6	2.5	4.0	1.7	2.7	17	10	3	2	0	0	6	0	0
Oct	14	6	5	0	16	14	7	22	9	46.7	46.9	47.2	46.9	81.7	51.6	73.8	69.0	3.4	3.7	3.7	3.6	16	10	5	7	0	2	1	0	0
Nov	12	5	4	3	12	14	10	28	2	32.1	32.5	33.1	32.6	80.5	53.2	71.6	68.4	4.0	3.5	3.5	3.7	15	8	7	8	0	13	0	1	0
Dec	15	5	4	6	11	9	3	29	11	26.2	28.8	28.1	27.7	85.5	69.5	79.1	78.0	5.7	7.8	5.8	6.8	7	11	18	9	7	20	0	0	0
Sums..	84	81	82	83	125	145	75	298	123	518.7	529.2	532.7	526.8	998.8	712.1	926.0	878.9	59.2	64.8	53.2	59.1	112	156	98	122	18	91	14	17	1
	Percentages.																					Percentages.								
Means.	7.7	7.4	7.5	7.6	11.4	13.2	6.8	27.2	11.2	43.2	44.1	44.4	43.9	83.2	59.3	77.2	73.2	4.9	5.4	4.4	4.9	30.6	42.6	26.8	33.3	4.9	24.9	3.8	4.6	.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7 a. m., 3 p. m., and 11 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.300; February, 0.300; March, 0.300; April, 0.290; May, 0.280; June, 0.280; July, 0.280; August, 0.280; September, 0.280; October, 0.290; November, 0.300; December, 0.300.

GEO. HEATHCOTE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NASHVILLE, TENN.

Location of office on December 31, 1884, Barns' Block, Public Square and North Market street.

[Latitude, 36° 10′ N.; longitude, 86° 47′ W. Elevation of barometer above sea-level, 549 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 79 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.660	29.611	29.657	29.643	30.074	26	29.136	31	.938	25.7	35.4	29.3	30.1	65.4	30	—10.2	6	75.6	39.4	21.5	7.20	1.16	7, 8	36	NW.	31	NW.	5,320
Feb	29.504	29.442	29.490	29.479	29.909	15	28.856	19	1.053	42.1	51.4	44.5	46.0	71.9	12	9.8	29	62.1	54.9	38.0	8.18	2.32	6, 7	49	W.	19	E., S.	5,152
Mar	29.462	29.419	29.486	29.439	29.828	9	28.955	1	.873	43.7	54.3	49.2	49.1	76.2	28	19.4	14	56.8	57.4	42.1	8.89	2.33	25	31	W.	1	E.	5,485
Apr	29.377	29.345	29.359	29.360	29.599	11	28.857	14	.742	50.8	62.5	55.7	56.3	81.5	29	34.1	9	47.4	65.5	48.3	3.51	1.67	14	46	NW.	2	SE., W., NW.	5,427
May	29.422	29.377	29.401	29.400	29.614	30	29.169	18	.445	62.2	75.4	67.2	68.3	87.8	22	48.4	30	39.4	77.7	59.9	3.58	1.26	13, 14	36	SW.	4, 13	W.	5,028
June	29.442	29.400	29.418	29.420	29.660	16	29.096	9	.564	68.5	78.9	71.8	73.1	92.2	22	58.3	1	33.9	81.5	66.0	6.58	1.59	5, 6	36	NW.	9	E.	3,524
July	29.303	29.357	29.373	29.374	29.568	21	29.189	9	.379	72.6	85.2	76.6	78.1	93.6	5	63.8	7	29.8	87.2	70.2	3.18	.70	9	47	NW.	5	W.	3,294
Aug	29.506	29.453	29.480	29.480	29.609	9	29.159	29	.450	68.5	84.0	73.7	75.4	94.3	29	56.5	6	37.8	85.8	66.3	2.81	1.44	3	38	NW.	29	NW., NE.	3,100
Sept	29.529	29.468	29.501	29.499	29.723	15	29.292	28	.431	67.3	82.5	73.2	74.3	91.2	3	51.5	19	39.7	84.8	65.1	2.36	.56	27	27	S.	22	E.	3,182
Oct	29.595	29.542	29.569	29.569	29.859	24	29.328	8	.531	58.1	78.6	63.8	65.2	91.9	1	30.2	24	61.7	76.0	55.9	2.43	1.42	29	31	SE.	26	NW.	3,869
Nov	29.565	29.526	29.550	29.547	29.940	6	29.087	28	.853	41.0	56.4	46.9	48.1	73.1	3	27.3	24	45.8	50.6	37.5	1.57	.65	23	40	SE.	23	W.	3,547
Dec	29.557	29.515	29.551	29.541	29.969	19	28.917	6	1.052	36.9	44.6	39.7	40.4	67.0	30	0.9	19	66.1	49.5	31.2	3.78	1.13	14	30	W.	14	SE.	5,810
Sums ..	354.012	353.455	353.785	353.751	....	...	....	...	8.311	637.4	784.2	691.6	704.4	....	....	......	...	596.1	819.3	602.0	54.02	....	......	...	....	....	....	52,738
Means .	29.501	29.455	29.482	29.479	30.074	*26	28.856	†19	.693	53.1	65.4	57.6	58.7	94.3	‡29	—10.2	*6	49.7	68.3	50.2	.....	....	......	...	....	....	NW.	......

*January. †February. ‡July.

NASHVILLE, TENN—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan....	7	8	6	10	21	7	9	25	0	22.2	28.0	23.8	24.7	86.2	74.8	80.0	80.3	7.7	7.8	6.1	7.2	4	10	17	14	9	24	0	1	31	11	17	+9	4	10	22	7	21	2.3
Feb....	6	6	16	13	16	5	10	15	0	36.8	41.4	38.7	39.0	81.4	68.8	80.8	77.2	7.0	6.9	6.7	6.9	5	8	16	16	1	7	0	1	46	11	15	15	6	28	31	5	35	2.4
Mar....	9	11	21	14	6	5	8	19	0	37.6	40.6	40.2	39.5	79.9	63.2	73.1	72.1	7.7	7.9	6.5	7.4	3	10	18	15	0	7	0	4	49	3	15	18	9	4	35	6	33	8.9
Apr....	2	6	13	17	7	11	17	17	0	44.6	45.6	46.4	45.5	80.5	57.3	71.7	69.8	6.5	7.1	5.9	6.5	6	10	14	13	0	0	0	5	24	7	1	7	2	14	17	5	15	0.0
May ...	8	12	11	8	12	10	17	15	0	55.1	53.9	56.5	55.2	77.8	49.1	69.7	65.5	5.1	6.6	4.5	5.4	6	18	7	10	0	0	0	11	16	11	1	8	7	31	13	4	8	3.6
June ..	8	12	28	13	5	5	6	13	0	64.2	54.8	66.6	65.2	86.3	63.9	84.2	78.1	6.0	7.3	5.0	6.1	7	11	12	17	0	0	3	11	13	1	15, 16	2	11	5	10	2	5	9.8
July...	7	17	3	0	8	18	24	16	0	67.6	68.3	69.8	68.6	84.4	58.2	80.2	74.3	5.2	5.8	3.7	4.9	7	18	6	12	0	0	8	9	8	2	1	1	10	27, 28	6	4	4	5.2
Aug ..	12	17	15	10	6	6	10	17	0	64.1	64.0	65.8	64.6	85.9	51.4	76.7	71.3	3.6	5.8	3.3	4.2	8	21	2	9	0	0	6	8	7	4	5	1	1	28, 29	6	3	2	11.6
Sept ...	9	14	19	14	9	9	9	7	0	62.0	64.8	65.7	64.2	83.8	56.4	77.9	72.7	5.4	6.2	3.1	4.9	8	16	6	9	0	0	3	5	3	8	4	+0	6	30	3	2	1	5.4
Oct	7	15	13	11	10	2	13	21	1	53.7	52.7	55.6	54.0	85.5	50.9	75.6	70.7	3.6	4.6	2.7	3.6	16	9	6	4	0	1	5	0	1	4	31	—0	2	25, 26, 27	1	6		3.5
Nov ...	3	9	13	10	13	6	21	15	0	37.6	40.1	39.9	39.2	87.9	55.5	77.0	73.5	3.4	4.3	3.2	3.6	13	12	5	4	0	6	0	0	1	5	8, 9	+0	5	21, 22	1	0		9.8
Dec....	7	7	16	24	5	5	15	14	0	32.7	35.0	33.4	33.7	84.7	70.0	78.8	77.8	7.6	7.9	6.9	7.5	3	8	20	10	3	15	0	0	14	10	26		8	1	14	2	5	8.8
Sums ..	85	134	174	144	118	89	159	194	1	578.2	599.2	602.4	593.4	1004.3	720.5	925.2	883.3	68.8	78.2	57.6	68.2	86	151	129	133	13	60	25	55	......		....	....	..	....	162	10	134	11.3
	Percentages.																					Percentages.																	
Means.	7.7	12.2	15.8	*13.1	10.7	8.1	14.5	17.7	.1	48.2	49.9	50.2	49.4	83.7	60.0	77.1	73.6	5.7	6.5	4.8	5.7	23.5	41.3	35.2	36.3	3.6	16.4	6.8	15	49	3	†15	—0	2	‡25, 26, 27	13	6.8	11	2.9

* See L. R.

† March.

‡ October.

NOTE.—7 a. m., 3. p. m., and 11 p. m., Washington time, correspond to 6.21 a. m., 2.21 p. m., and 10.21 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.610; February, 0.610; March, 0.600; April, 0.580; May, 0.570; June, 0.560; July, 0.560; August, 0.560; September, 0.570; October, 0.580; November, 0.600; December, 0.610.

REMARKS.—January, average temperature, 9°.5 below 12-year average; heavy snows; 13 inches on 7th; 4 inches on 24th; pink sunset glows on 12th, 20th, 21st, and 29th. February, river above danger-line, 11th to 19th; pink sunset glows, 1st to 2d. March, wind-storms with heavy snow, for five minutes, afternoon of 1st; pink sunset glows, 24th and 26th; planting much retarded; river above danger-line, 9th to 20th; last snow 25th. April, last ice, 9th; last frost, 25th; pink sunset glows, 15th, 25th, 27th, 29th, and 30th; continued cool weather retards planting. May, pink sunset glows, 9th; hail-storm, 4th. June, pink sunset glows, 27th. July, pink sunset glows, 1st, 12th, 14th, 15th, 18th, 20th, 21st, 22d, 23d. August, pink sunset glows, 2d, 5th, 6th, 12th, 13th. September, pink sunset glows, 1st, 2d, 5th, 13th, 14th, 15th, 18th, 20th. October, first frost of the season, 16th, light; first killing frost, 23d; first ice of season, 24th; pink sunset glows, 2d, 4th, 5th, 6th, 7th, 8th, 10th, 11th, 12th, 13th, 14th, 15th, 17th, 18th, 19th, 21st, 31st; river below zero of gauge, 20th and 28th; no thunder-storms. November, first snow of season, 28th; no thunder-storms. December, normal temperature; sleet, 17th and 27th; pink sunset glows, 2d, 3d, 4th, 8th, 10th, 19th, 22d; pink sunrise glows, 2d, 3d, 4th, 7th, 16th, 19th, 23d, 29th, 30th; very late steamboat season; no electric manifestations during month.

L. N. JESUNOFSKY, *Sergeant, Signal Corps, U. S. A.*

Meteorological summary for the year ending December 31, 1884—Continued.

NEW HAVEN, CONN.

Location of office on December 31, 1884, Insurance Building, No. 370 Chapel street.

[Latitude, 41° 18′ N.; longitude, 72° 56′ E. Elevation of barometer above sea-level, 107 feet. Elevation of exposed thermometer above ground, 112 feet. Elevation of rain-gauge above ground, 109 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	30.018	29.964	29.989	29.990	30.708	27	29.070	9	1.638	19.8	27.1	22.7	23.2	50.4	9	4.2	21	46.2	32.6	15.8	4.63	1.09	8, 9	44	E.	9	SW.	6,809
Feb	29.958	29.921	29.982	29.954	30.622	16	29.015	28	1.607	29.9	34.6	30.5	31.7	52.8	20 14	.7	29	52.1	40.8	24.3	5.57	1.28	17, 18	31	W.	29	N.	6,036
Mar	29.915	29.860	29.895	29.890	30.313	16	29.403	26	.910	29.5	38.7	32.7	33.6	58.2	24	.8	1	57.4	42.4	26.6	4.15	.82	26	35	NW.	30	N.	6,179
Apr	29.736	29.676	29.735	29.716	30.072	14	29.026	3	1.046	42.1	50.1	42.5	44.9	66.1	27	29.2	1	36.9	54.1	37.2	2.36	.86	15, 16	31	NW.	3	N.	6,778
May	29.847	29.797	29.851	29.832	30.205	31	29.445	10	.760	53.6	62.1	52.1	55.9	85.0	24	32.0	30	53.0	65.8	47.2	3.32	1.28	6, 7	24	NE., S., NW.	7 15 16	NW.	5,699
June	30.000	29.954	29.977	29.977	30.448	15	29.658	9	.790	63.3	75.1	61.9	66.8	92.0	21	41.4	15	50.6	78.2	55.4	5.26	4.79	25, 26	23	N., NE.	26	S.	4,211
July	29.765	29.713	29.737	29.738	29.923	4	29.467	13	.456	64.8	73.8	65.3	67.8	87.1	3	54.5	17	32.6	76.5	60.5	5.89	2.13	19, 20	21	NW.	23	S.	4,765
Aug	29.962	29.922	29.943	29.942	30.234	25	29.632	30 31	.602	65.4	75.3	66.6	69.1	90.0	20	45.7	25	44.3	77.7	61.3	5.60	2.05	29, 30	21	N.	15	S.	3,957
Sept	30.008	29.951	29.986	29.982	30.375	14	29.617	17	.758	61.6	73.9	63.8	66.4	90.0	10	40.2	14	49.8	76.7	56.5	1.41	.75	29	22	SW.	16	SW.	4,047
Oct	30.038	29.963	30.011	30.004	30.452	26	29.595	8 17	.857	49.1	59.8	51.1	53.2	81.3	4	26.5	26	54.8	62.5	43.9	2.49	.90	30	26	W.	18	SW.	5,787
Nov	29.961	29.925	29.935	29.940	30.356	22	29.332	28	1.024	36.7	46.1	39.9	40.9	62.0	23	17.5	25	44.5	50.2	31.7	2.24	.95	28, 29	34	S.	28	SW.	5,667
Dec	30.060	30.012	30.021	30.031	30.595	27	29.449	7	1.146	27.9	34.9	31.6	31.5	60.0	7	−9.5	20	69.5	39.9	24.0	6.41	1.99	21, 22	29	SE.	6	N.	6,701
Sums	359.268	358.658	359.062	358.996	....	...	....	...	11.594	543.7	650.5	560.7	585.0	....	....	......	...	591.7	697.4	484.4	49.33	....	......	...	....	...	....	66,586
Means	29.939	29.888	29.922	29.916	30.708	*27	29.015	†28	.966	45.3	54.2	46.7	48.7	92.0	‡21	−9.5	§20	49.3	58.1	40.4	....	....	......	...	....	...	N.	......

* January. † February. ‡ June. § December.

NEW HAVEN, CONN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	16	19	1	0	4	23	18	10	2	14.0	17.1	15.6	15.6	78.9	67.6	74.0	73.5	5.3	6.7	3.8	5.3	9	13	9	13	13	30	0	0	0
Feb	21	16	6	10	6	6	7	11	4	26.7	26.8	25.6	26.4	88.2	75.0	82.7	82.0	7.0	6.8	5.5	6.4	4	14	11	17	3	23	0	0	0
Mar	21	15	3	2	6	7	12	15	12	24.0	26.3	25.6	25.3	80.4	63.5	76.2	73.4	6.4	6.4	4.0	5.6	9	11	11	14	6	18	0	2	2
Apr	29	14	3	5	8	7	5	17	2	34.3	34.5	34.8	34.5	74.7	58.0	75.5	69.4	6.3	5.7	5.1	5.7	7	12	11	13	0	6	0	0	1
May	6	10	4	9	19	9	12	22	2	44.9	44.5	44.5	44.6	74.7	57.0	77.0	69.6	4.5	4.5	2.8	3.9	12	16	3	14	0	0	0	2	0
June	6	12	5	11	22	20	2	6	6	56.0	55.9	55.6	55.8	78.2	53.9	80.5	70.9	2.1	3.1	1.8	2.3	21	6	3	5	0	0	1	1	0
July	13	5	4	4	22	16	13	13	3	58.4	59.1	60.0	59.1	80.3	63.6	83.1	75.7	5.2	4.9	4.0	4.7	14	9	8	16	0	0	0	2	1
Aug	16	10	3	5	29	15	3	3	9	61.2	62.1	62.3	61.9	86.9	65.3	86.4	79.5	4.6	6.0	5.2	5.3	7	18	6	13	0	0	0	2	0
Sept	13	5	1	3	14	28	4	12	10	56.4	57.8	58.0	57.4	83.5	58.8	82.0	74.8	3.2	3.0	2.5	2.9	16	10	4	7	0	0	0	1	2
Oct	21	6	1	1	5	26	8	21	4	43.0	44.1	44.4	43.8	80.1	59.4	78.6	72.7	5.0	5.2	3.4	4.5	12	11	8	8	0	2	0	0	0
Nov	17	4	2	2	3	21	18	19	4	30.7	33.7	33.2	32.5	79.1	63.1	77.9	73.4	4.3	4.1	3.7	4.0	15	9	6	11	0	15	0	0	0
Dec	20	19	1	1	1	17	18	10	6	23.8	26.3	26.2	25.4	84.8	72.9	80.8	79.5	5.3	6.2	4.0	5.2	9	14	8	16	8	21	0	0	0
Sums	199	135	34	53	139	195	120	159	64	473.4	488.2	485.8	482.3	969.8	758.1	954.7	894.4	59.2	62.6	45.8	55.8	135	143	88	147	30	115	1	10	6
	Percentages.																					Percentages.								
Means	18.1	12.3	3.1	4.9	12.7	17.8	10.9	14.5	5.8	39.4	40.7	40.5	40.2	80.8	63.2	79.6	74.5	4.9	5.2	3.8	4.6	36.9	39.1	24.0	40.2	8.2	31.4	.3	2.7	1.6

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.16 a. m., 3.16 p. m., and 11.16 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .007 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120 February, 0.120; March, 0.120; April, 0.120; May, 0.120; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

J. H. SHERMAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NEW LONDON, CONN.

Location of office on December 31, 1884, United States custom-house.

[Latitude 41° 21′ N.; longitude, 72° 5′ W. Elevation of barometer above sea-level, 47 feet. Elevation of exposed thermometer above ground, 29 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.124	30.049	30.067	30.080	30.783	27	29.182	2	1.601	22.9	29.5	25.8	26.1	51.5	9	6.0	6	45.5	33.5	19.7	6.12	2.32	8, 9	42	SE.	9	NW.	6,782
Feb	30.042	29.997	30.070	30.036	30.732	16	28.918	28	1.814	31.9	36.8	32.0	33.6	51.5	18	3.0	29	48.5	41.0	26.7	5.62	1.17	23	38	E.	20	NW.	5,585
Mar	29.986	29.940	29.964	29.963	30.435	16	29.458	26	.977	32.2	39.6	35.5	35.8	60.0	24	4.0	1	56.0	43.5	29.4	5.53	1.38	19, 20	32	E., W.	{26} {30}	NW.	6,139
Apr	29.790	29.745	29.794	29.776	30.148	14	29.050	3	1.098	43.5	49.7	42.9	45.4	67.0	30	29.0	1	38.0	53.5	38.1	3.99	1.29	15, 16	28	W., E.	{8} {15}	W.	4,978
May	29.918	29.882	29.929	29.910	30.291	31	29.496	10	.795	55.1	59.9	52.4	55.8	83.0	24	34.7	30	48.3	65.1	46.5	5.64	1.44	6, 7	28	NE.	7	SW.	5,583
June	30.076	30.042	30.055	30.058	30.509	15	29.752	9	.757	64.8	69.4	61.1	65.1	87.5	21	43.0	15	44.5	74.7	55.5	6.29	3.97	25, 26	24	SE.	22	SW.	4,066
July	29.828	29.793	29.810	29.810	30.008	4	29.547	13	.461	66.4	71.2	64.9	67.5	83.0	24	55.0	16	28.0	74.3	60.5	6.02	1.49	27, 28	26	SE.	19	SW.	4,696
Aug	30.039	30.009	30.030	30.026	30.307	25	29.711	31	.596	66.9	72.5	66.1	68.5	85.7	20	47.5	25	38.2	75.5	62.0	7.18	2.38	7, 8	22	S.	26	S.	3,796
Sept	30.081	30.035	30.066	30.061	30.443	14	29.698	17	.745	64.2	72.3	64.1	66.9	88.8	10	45.4	15	43.4	74.9	58.7	1.32	0.51	29	23	SW., S.	{16} {20}	SW.	3,854
Oct	30.111	30.030	30.093	30.085	30.528	26	29.656	17	.872	51.8	59.0	53.0	54.6	79.2	1	30.6	26	48.6	62.6	46.8	3.53	1.05	30	25	SW.	22	SW.	5,244
Nov	30.043	30.012	30.015	30.023	30.480	3	29.359	29	1.121	39.4	47.2	42.2	42.9	60.6	17	22.8	25	37.8	51.8	35.0	2.78	1.24	28, 29	49	S.	23	W.	5,439
Dec	30.138	30.092	30.103	30.111	30.684	27	29.533	7	1.151	31.7	37.4	34.4	34.5	57.3	7	—5.2	20	62.5	41.4	27.7	7.86	2.27	6, 7	40	SE.	7	SW.	6,124
Sums ..	360.176	359.646	359.996	359.939	....	...	....	...	11.988	570.8	644.5	574.4	596.7	..	....	....	...	539.3	691.8	506.6	61.88	....	....	...	....	....	....	62,286
Means .	30.015	29.970	30.000	29.995	30.783	*27	28.918	†28	.999	47.6	53.7	47.9	49.7	88.8	‡10	—5.2	§20	44.9	57.6	42.2	.....	....	....	...	....	....	SW.	......

* January. † February. ‡ September. § December.

NEW LONDON, CONN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	18	16	2	6	2	7	20	22	0	16.6	21.6	19.2	19.1	77.1	73.5	76.3	75.6	5.2	6.2	3.5	5.0	8	16	7	13	14	29	0	0	0
Feb	9	14	10	3	12	8	8	20	3	28.6	31.2	26.2	28.7	87.8	81.2	79.7	82.9	7.2	6.4	6.1	6.6	4	13	12	18	1	18	0	1	0
Mar	10	8	5	3	5	8	17	30	7	26.9	30.7	29.2	28.9	81.2	73.0	78.8	77.7	5.6	6.4	4.3	5.4	9	12	10	19	5	17	0	1	1
Apr	14	11	7	2	7	8	15	14	12	35.8	37.4	35.7	36.3	75.6	65.1	76.5	72.4	5.7	6.3	5.5	5.8	7	10	13	13	0	4	0	0	0
May	2	9	5	7	12	22	18	13	5	45.3	46.0	44.4	45.2	72.0	64.6	76.0	70.9	4.7	4.9	3.0	4.2	13	14	4	11	0	0	0	2	0
June	6	12	5	10	9	34	0	5	9	57.5	58.0	55.2	56.9	78.2	68.1	81.3	75.9	3.2	2.7	2.3	2.7	19	7	4	5	0	0	0	2	0
July	11	5	2	5	14	23	22	6	5	59.9	62.4	60.8	61.0	81.0	75.7	87.4	81.4	4.3	4.8	3.2	4.1	13	12	6	16	0	0	0	6	0
Aug	17	8	0	3	26	21	6	3	9	63.6	66.7	62.9	64.4	89.4	83.2	89.6	87.4	5.2	5.7	4.5	5.1	10	13	8	15	0	0	0	3	0
Sept	11	3	3	1	7	36	7	10	12	58.4	60.0	59.4	59.3	82.2	67.3	85.2	78.2	2.4	2.3	3.0	2.6	18	9	3	7	0	0	0	1	2
Oct	20	7	3	0	7	26	13	12	5	47.6	52.8	49.1	49.8	86.3	80.8	87.0	84.7	4.3	4.8	4.6	4.6	11	13	7	17	0	1	0	0	0
Nov	9	4	3	3	8	19	27	17	0	33.9	36.8	36.2	35.6	80.8	68.5	79.6	76.3	5.1	4.1	3.7	4.3	14	10	6	10	0	10	0	0	0
Dec	19	14	0	1	8	22	12	14	3	27.2	30.4	29.9	29.2	84.0	77.3	83.9	81.7	5.7	5.2	5.1	5.3	7	14	10	17	7	17	0	0	0
Sums ..	146	111	45	44	117	234	165	166	70	501.3	534.0	508.2	514.4	975.6	878.3	981.3	945.1	58.6	59.8	48.8	55.7	133	143	90	161	27	96	0	16	3
	Percentages.																					Percentages.								
Means	13.3	10.1	4.1	4.0	10.7	21.3	15.0	15.1	6.4	41.8	44.5	42.4	42.9	81.3	73.2	81.8	78.8	4.9	5.0	4.1	4.7	36.3	39.1	24.6	44.0	7.4	26.2	0	4.4	0.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.20 a. m., 3.20 p. m., and 11.20 p. m., local time.

Correction for instrumental error of barometer used: From 7.20 a. m., January 1, to 11.20 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, the most destructive gale for years occurred on the 29th; February, severe storms on the 1st, 20th, 23d, and 29th; March, gales on the 19th, 26th, and 30th; April, very mild weather after first week; May, unusual displays of sheet-lightning on the 22d, 23d, and 24th; June, last frost of the season on the 15th, mirage 23d, very heavy rain 25th and 26th; July, remarkably low barometer and very small range; August, earthquake on the 10th, at 2.12 p. m.; September, highest temperature of the year on the 10th, very dry month; October, first light frost on the 10th, first killing frost 16th, mirage 15th; November, first snow 19th, remarkable meteor 5th, very severe gale 23d and 24th; December, extremes of temperature, lowest of the year on the 20th, dangerous gales, large rainfall.

JNO. G. LYNCH,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NEW ORLEANS, LA.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 29° 58′ N.; longitude, 90° 4′ W. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain gauge above ground, 84 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.202	30.159	30.196	30.186	30.656	21	29.700	23	.956	43.4	51.8	46.1	47.1	72.0	30, 31	22.5	6	49.5	56.1	37.8	4.35	1.42	23, 24	30	N.	2, 8	N.	6,817
Feb	30.058	30.007	30.054	30.040	30.376	20	29.667	27	.709	56.1	66.6	59.3	60.7	77.1	8	32.7	15	44.4	68.7	52.6	3.16	1.57	16	34	N.	27	N.	5,400
Mar	29.994	29.957	29.980	29.977	30.304	15	29.748	23	.556	60.4	69.5	64.6	64.8	80.5	28	40.9	1	39.6	71.4	57.3	8.24	3.10	17, 18	36	S.	17	S.	6,008
Apr	29.929	29.901	29.916	29.915	30.150	9	29.587	5	.563	64.3	73.0	67.3	68.2	82.0	19	50.0	24	32.0	74.5	61.0	6.48	2.96	5	26	E.	5	S.	4,818
May	29.947	29.921	29.937	29.935	30.084	23	29.758	27	.326	73.3	80.5	75.4	76.4	86.2	23	61.7	8	24.5	81.9	69.4	4.33	1.30	17	28	SE.	21	S.	4,800
June	29.923	29.903	29.907	29.911	30.085	1	29.752	10	.333	77.3	82.9	77.9	79.4	90.9	24	68.5	1, 11	22.4	84.6	72.9	8.60	1.75	30	25	NE.	18	SE.	4,762
July	29.947	29.920	29.918	29.927	30.060	24	29.762	10	.298	82.1	89.5	84.5	85.4	94.7	6	71.4	26	23.3	90.7	77.8	4.12	1.00	4	37	W.	26	W.	5,049
Aug	29.979	29.946	29.954	29.960	30.091	21	29.785	30	.306	78.5	87.0	81.5	82.3	93.4	29	65.5	8	27.9	88.0	74.4	.87	.29	21	34	NW.	4	NE.	4,372
Sept	29.977	29.949	29.975	29.967	30.133	20	29.811	1	.322	77.5	85.6	79.5	80.9	92.3	12	70.2	16	22.1	86.3	73.8	3.12	.87	6, 7	24	SE.	7	E.	4,576
Oct	30.036	30.004	30.034	30.025	30.293	24	29.887	8	.406	70.5	79.2	73.5	74.4	90.0	8	49.0	24	41.0	80.3	67.2	5.60	1.63	2, 3	28	E.	25	E.	5,041
Nov	30.080	30.046	30.078	30.068	30.379	6	29.631	28	.748	55.2	65.3	58.7	59.7	75.6	22	42.2	7	33.4	66.7	52.2	3.13	2.08	22	28	SE.	22	NE.	4,709
Dec	30.022	29.991	30.032	30.015	30.399	19	29.623	5	.776	56.5	62.8	57.7	58.7	76.5	22	28.8	19	47.7	65.6	51.8	8.01	2.10	14	28	SE.	28	N.	7,090
Sums	360.094	359.704	359.976	359.926	....	...	....	...	6.299	794.1	893.7	826.0	838.0	....	.....	......	....	407.8	915.8	748.2	60.01	....	......	...	....	....	....	62,987
Means	30.008	29.975	29.998	29.994	30.656	*21	29.587	†5	.525	66.2	74.5	68.8	69.8	94.7	‡6	22.5	*6	34.0	76.3	62.4	.....	....	......	...	....	....	N.	......

* January. † April. ‡ July.

NEW ORLEANS, LA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.					
										Washington time.																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																	Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan	30	8	11	17	7	5	3	7	5	36.8	38.7	37.7	37.7	78.0	62.6	73.4	71.3	4.7	6.2	3.7	4.9	10	14	7	13	0	10	0	0	3 9	20	10 6	1	6 9	5 4.4
Feb	20	9	4	17	18	8	2	3	6	49.8	50.2	50.1	50.0	80.0	57.8	73.6	70.5	3.3	5.8	3.8	4.3	11	12	6	7	0	0	0	1	1 5	28	5 6	10	4 1	3 4.5
Mar ...	16	4	7	17	19	17	4	6	3	53.8	52.3	56.9	54.3	80.4	58.0	77.2	71.9	6.3	5.7	5.0	5.7	8	12	11	12	0	0	0	4	*0 1	{18, 19, 24}	—1 5	1, 2, 4	1 6	0 5.8
Apr ...	9	8	5	17	18	14	6	10	3	56.9	54.5	58.5	56.6	78.0	55.0	74.5	69.2	5.3	5.4	4.2	5.0	10	10	10	7	0	0	0	3	0 6	{1, 2, 3, 5, 6}	1 10	{28, 29, 30}	1 4	1 2.6
May ...	13	9	8	13	21	9	7	10	3	67.0	64.3	66.6	66.0	81.0	58.9	74.9	71.6	5.3	6.6	4.5	5.5	6	15	10	16	0	0	0	9	1 5	14, 15	1 11	1	0 6	1 7.3
June...	4	10	16	20	8	16	7	6	3	70.5	67.3	69.8	69.2	80.0	60.6	76.6	72.4	4.6	6.7	2.7	4.7	6	19	5	17	0	0	2	9	1 9	1, 2	4 4	29, 30	2 7	2 11.7
July ...	7	7	3	2	10	21	28	13	2	75.1	71.3	75.1	73.8	79.7	55.9	73.6	69.7	3.8	6.3	2.9	4.3	10	18	3	10	0	0	22	6	4 6	1	8 4	31	3 10	6 4.1
Aug ...	16	22	18	13	2	5	2	12	3	72.2	67.1	71.7	70.3	81.7	52.7	72.2	68.9	2.9	5.3	2.2	3.5	13	16	2	8	0	0	8	6	8 8	1	12 7	29–31	3 11	10 9.0
Sept ...	7	10	34	24	6	1	0	6	2	72.2	68.8	72.8	71.3	84.4	58.6	80.3	74.4	2.6	5.6	1.6	3.3	16	12	2	11	0	0	3	2	12 1	5, 6, 7	12 11	19	0 10	12 5.7
Oct	20	21	30	9	1	0	3	4	5	63.9	62.8	65.0	63.9	80.7	60.0	75.9	72.2	3.3	4.6	2.0	3.3	17	9	5	10	0	0	0	3	10 7	{14, 15, 16, 27}	12 6	7	1 11	11 6.3
Nov ...	20	28	13	9	4	1	2	10	3	48.1	45.3	49.2	47.5	77.6	50.8	71.6	66.7	4.0	4.4	2.2	3.5	16	10	4	5	0	0	0	1	11 10	1	13 2	21	1 4	12 4.8
Dec	25	8	17	17	8	9	2	5	2	50.5	51.1	51.2	50.9	83.3	68.1	79.5	77.0	6.5	6.8	5.8	6.4	7	11	13	15	0	1	0	2	10 7	31	14 0	3	3 5	12 6.9
Sums .	187	144	166	175	122	106	66	92	40	716.8	693.7	724.6	711.5	964.8	699.0	903.3	855.8	52.6	69.4	40.6	54.4	130	158	78	131	0	11	35	46	......	....	......	....	32 0	81 1.1
	Percentages.																					Percentages.													
Means	17.0	13.1	15.1	15.9	11.1	9.7	6.0	8.4	3.6	59.7	57.8	60.4	59.3	80.4	58.2	75.3	71.3	4.4	5.8	3.4	4.5	35.5	43.2	21.3	35.8	.0	3.0	9.6	12.6	*0 1	{†18, 19, 24}	14 0	‡3	2 8	6 9.1

* Above high-water mark of 1874. † March. ‡ December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.08 a. m., 2.08 p. m., and 10.08 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, —.004 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.060; February, 0.060; March, 0.060; April, 0.060; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.060; December, 0.060.
REMARKS.—Destructive floods in the Mississippi and Red River Valleys from February to June, inclusive.

M. HERMAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NEW YORK CITY.

Location of office on December 31, 1884, Equitable building.

[Latitude, 40° 43′ N.; longitude, 74° 0′ W. Elevation of barometer above sea-level, 164 feet. Elevation of exposed thermometer above ground, 148 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.982	29.925	29.955	29.954	30.681	27	28.961	9	1.720	23.5	29.4	25.7	26.2	47.0	9	7.8	7	39.2	32.9	19.7	6.07	2.48	8, 9	33	E.	9	SW.	6,203
Feb	29.905	29.885	29.942	29.911	30.561	16	29.023	28	1.538	33.9	38.0	33.3	35.1	61.0	6	2.0	29	59.0	42.2	27.8	5.09	1.20	17, 18	40	W.	20	NE.	5,610
Mar	29.878	29.809	29.856	29.846	30.277	16	29.337	26	.940	33.6	42.1	36.8	37.5	63.0	28	5.0	1	58.0	44.4	31.1	4.43	1.02	19, 20	36	W.	30	W.	6,305
Apr	29.699	29.633	29.695	29.676	30.015	22	28.956	2	1.059	44.2	53.3	45.4	47.6	73.5	30	32.1	6	41.4	56.6	40.6	2.66	.78	2, 3	37	NW.	4	NW.	5,910
May	29.798	29.746	29.798	29.781	30.145	31	29.416	11	.729	55.0	64.9	56.5	58.8	84.7	24	42.4	30	42.3	68.0	51.3	4.85	1.93	6, 7	31	NE.	7	W.	6,154
June	29.940	29.902	29.921	29.921	30.378	15	29.572	9	.806	64.8	75.5	65.8	68.7	92.0	21	49.1	15	42.9	79.3	60.5	4.16	3.63	25, 26	30	NE.	26	S.	5,118
July	29.720	29.666	29.701	29.696	29.847	4	29.407	13	.440	66.8	75.6	67.9	70.1	90.5	8	57.4	30	33.1	78.7	63.1	6.14	2.01	12, 13	36	SW.	23	W.	7,181
Aug	29.907	29.872	29.897	29.892	30.176	25	29.569	30	.607	68.5	76.7	69.3	71.5	92.0	20	56.3	25	35.7	79.8	64.7	8.56	2.22	4, 5	32	E.	30	SE.	5,852
Sept	29.966	29.910	29.947	29.941	30.315	14	29.578	17	.737	64.6	76.7	67.6	69.6	92.0	10	50.9	14	41.1	79.8	61.9	.15	.11	29	27	S.	29	S.	6,203
Oct	29.996	29.985	29.978	29.968	30.415	26	29.561	8	.854	51.9	62.0	54.3	56.1	84.5	1	32.5	26	52.0	65.3	48.8	3.63	1.46	29, 30	44	W.	18	W.	8,644
Nov	29.914	29.878	29.889	29.894	30.292	22	29.169	29	1.123	39.6	47.8	42.2	43.2	62.6	15	20.8	25	41.8	51.5	36.8	3.44	1.40	23, 24	40	W.	24	W.	8,231
Dec	30.009	29.957	29.974	29.980	30.512	26	29.334	7	1.178	31.7	37.6	34.5	34.6	60.0	31	1.2	20	58.8	41.7	28.5	6.66	2.10	21	40	NW.	9	NW.	8,419
Sums	358.709	358.118	358.548	358.460	....	...	....	...	11.731	578.1	679.6	599.3	619.0	....	....	......	...	545.3	719.2	534.3	55.84	....	....	...	....	....	....	79,275
Means	29.892	29.843	29.879	29.871	30.681	[1]27	28.956	[2]2	.978	48.2	56.6	49.9	51.6	92.0	[3]21 [4]20 [5]10	1.2	[6]20	45.4	59.9	44.5	.....	....	....	...	....	....	W.	......

[1] January. [2] April. [3] June. [4] August. [5] September. [6] December.

NEW YORK CITY—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	8	17	1	2	4	21	20	13	7	18.2	22.0	20.1	20.1	80.9	74.9	79.3	78.4	7.3	5.3	4.6	5.7	5	18	8	14	12	28	0	0	0
Feb	3	24	6	6	5	9	18	6	10	29.9	30.1	27.9	29.3	85.6	74.2	81.0	80.3	6.8	6.8	5.7	6.4	4	15	10	19	2	18	0	0	0
Mar	6	18	2	7	6	8	21	14	11	27.6	31.0	29.2	29.3	78.7	67.1	75.1	73.6	7.0	7.4	5.1	6.5	4	15	12	14	4	15	0	1	0
Apr	15	6	9	7	6	5	8	26	8	35.3	36.9	36.6	36.3	71.9	56.3	72.2	66.8	6.5	6.1	4.6	5.7	9	11	10	10	0	0	0	1	0
May	6	5	5	12	14	13	21	11	6	47.4	47.1	47.4	47.3	76.6	55.8	73.3	68.6	5.5	5.9	4.9	5.4	6	17	8	11	0	0	0	2	0
June	7	13	14	13	18	16	6	3	0	56.7	57.7	58.2	57.5	76.5	56.7	77.7	70.3	3.0	4.0	2.1	3.0	18	9	3	5	0	0	2	1	0
July	9	5	6	8	13	13	20	18	1	60.1	60.1	61.2	60.5	79.8	62.0	80.4	74.1	5.5	5.0	3.7	4.7	9	17	5	13	0	0	1	4	0
Aug	4	16	4	22	20	6	9	11	1	62.9	62.8	63.7	63.1	83.1	64.2	83.0	76.8	4.9	6.4	4.1	5.1	9	13	9	13	0	0	1	5	0
Sept	7	4	7	6	24	16	18	8	0	58.6	58.2	59.0	58.6	81.3	54.3	74.8	70.1	2.5	3.7	2.1	2.8	20	7	3	2	0	0	3	1	0
Oct	6	8	6	5	12	14	29	13	0	45.0	45.4	45.6	45.3	78.3	57.5	73.5	69.8	4.1	5.0	4.2	4.4	12	12	7	10	0	0	0	0	0
Nov	9	8	5	3	6	17	28	12	2	32.8	34.0	35.1	34.0	76.9	60.6	76.7	71.4	4.5	4.3	4.0	4.3	14	9	7	10	0	6	0	0	0
Dec	13	13	3	3	3	15	17	21	5	27.6	29.8	28.4	28.6	84.9	74.9	78.8	79.5	6.4	6.6	6.1	6.4	5	13	13	14	6	15	0	0	0
Sums ..	93	137	68	94	131	153	215	156	51	502.1	515.1	512.4	509.9	954.5	758.5	925.8	879.7	64.0	66.5	51.2	60.4	115	156	95	135	24	82	7	15	0
	Percentages.																					Percentages.								
Means .	8.5	12.5	6.2	8.6	11.9	13.9	19.6	14.2	4.6	41.8	42.9	42.7	42.5	79.5	63.2	77.2	73.3	5.8	5.5	4.8	5.0	31.4	42.6	26.0	36.9	6.6	22.4	1.9	4.1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.
Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, +.009 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.190; February, 0.190; March, 0.180; April, 0.180; May, 0.180; June, 0.170; July, 0.170; August, 0.170; September, 0.170; October, 0.180; November, 0.180; December, 0.190.

W. W. EICHELBERGER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NORFOLK, VA.

Location of office on December 31, 1884, Dalton building, corner Main street, Roanoke avenue.

[Latitude, 36° 51′ N.; longitude, 76° 17′ W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 52 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.155	30.111	30.136	30.134	30.793	27	29.301	8	1.492	34.9	41.9	37.9	38.2	67.0	24	10.2	6	56.8	46.7	29.9	5.94	1.64	8	35	SE.	8	N.	5,482
Feb	30.062	30.027	30.076	30.055	30.641	16	29.353	28	1.288	47.1	54.7	48.6	50.1	72.0	6, 7	22.8	29	49.2	59.0	41.0	4.58	1.12	20	27	S.	20	SW.	5,266
Mar	30.022	29.953	30.011	29.995	30.407	16	29.501	26	.906	46.5	55.3	49.1	50.3	75.0	26	23.3	1	51.7	58.1	42.1	9.13	1.88	13, 14	25	NW.	30	NW.	5,340
Apr	29.879	29.829	29.872	29.860	30.198	12	29.192	2	1.006	51.4	59.8	52.2	54.5	78.5	29	40.9	6	37.6	61.9	47.0	1.95	.64	22	28	NW	2	NE.	4,536
May	29.967	29.918	29.949	29.945	30.281	8	29.657	11	.624	64.7	74.9	64.6	68.1	91.1	24	47.8	30	43.3	76.9	58.8	1.25	.55	6	31	W.	2	S.	4,182
June	30.065	30.034	30.048	30.049	30.347	15 16	29.693	9	.654	70.8	79.0	70.5	73.4	92.5	21	58.0	1	34.5	81.8	64.6	6.45	1.92	30	20	NE., NE. S. N.	14 15 25 26	NE., SW.	4,974
July	29.912	29.877	29.898	29.896	30.086	22	29.694	29	.392	74.4	83.6	74.3	77.4	95.8	24	64.4	17	31.4	85.1	70.1	7.06	2.10	11	20	SW.	29	SW.	5,227
Aug	30.039	30.023	30.034	30.032	30.211	25	29.686	30	.525	73.6	81.0	73.4	76.0	92.4	20	64.6	14	27.8	82.5	70.4	2.95	1.20	5	22	N.	21	NE.	4,715
Sept	30.113	30.076	30.109	30.099	30.335	14	29.772	17	.563	69.4	81.4	70.9	73.9	89.4	30	58.9	15	30.5	82.3	66.5	.17	.12	25	22	NE.	14	SW.	4,716
Oct	30.175	30.121	30.143	30.146	30.525	26	29.822	8	.703	59.7	71.5	62.5	64.6	89.0	5	39.2	25	49.8	73.2	56.8	.47	.42	22, 23	26	N.	15	NE.	5,023
Nov	30.103	30.050	30.076	30.076	30.384	22	29.457	28	.927	47.5	58.2	52.1	52.6	73.8	2	36.3	21	37.5	60.9	45.1	.74	.34	28	25	S.	28	NE.	4,574
Dec	30.176	30.129	30.158	30.153	30.565	20	29.686	6	.879	41.4	49.3	44.9	45.2	70.0	12	12.2	19	57.8	52.5	38.2	4.36	1.39	21, 22	32	S.	6	N.	6,308
Sums	360.668	360.148	360.505	360.440	......	...	......	...	9.950	681.4	790.6	701.0	724.8	.....	...	......	...	512.9	820.9	630.5	45.05	....	......	...	....	...	....	60,343
Means	30.056	30.012	30.042	30.037	30.793	*27	29.192	†2	.830	56.8	65.9	58.4	60.4	95.8	‡24	10.2	6*	42.7	68.4	52.5	.....	....	......	...	....	...	SW., NE.	......

* January. † April. ‡ July.

NORFOLK, VA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.					
										Washington time.																									
	North.	Northeast.	East.	Southeast.	South.	Southeast.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																	*Ft. In.*		*Ft. In.*		*Ft. In.*	*Ft. In.*
Jan....	31	12	2	3	6	23	11	2	3	28.9	29.7	30.1	29.6	78.3	63.4	72.8	71.8	6.7	6.0	5.4	6.0	8	10	13	15	3	20	0	0	17 6	6, 21, 22, 29, 31	14 6	11	3 0	16 2
Feb....	14	10	6	1	15	17	4	9	11	42.9	43.2	41.4	42.5	85.5	67.0	76.6	76.4	6.1	6.1	5.3	5.8	6	12	11	15	1	5	0	1	18 6	18	15 0	9, 10	3 6	16 9
Mar ...	14	8	6	10	11	7	3	17	17	40.1	42.3	41.9	41.4	79.4	65.3	77.1	73.9	4.8	6.3	4.0	5.0	8	15	8	17	0	4	0	2	18 0	30, 31	15 0	10, 11, 12	3 0	16 7
Apr ...	9	21	7	11	3	5	7	18	9	42.8	41.4	42.8	42.3	73.7	53.4	71.6	66.2	5.7	5.9	3.6	5.1	10	11	9	8	0	0	0	2	19 0	30	15 6	10	3 6	17 1
May ...	8	16	7	10	17	12	7	3	13	56.2	54.0	56.1	55.4	75.5	50.9	74.9	67.1	4.8	4.8	3.6	4.4	11	14	6	7	0	0	1	2	19 6	29	15 0	11	4 6	16 11
June...	6	20	7	12	16	20	4	3	2	64.3	63.4	63.9	63.9	80.6	63.1	80.5	74.7	4.9	6.0	4.3	5.1	10	10	10	11	0	0	3	1	19 0	1, 3, 28	15 0	6, 8, 15, 22	4 0	16 10
July...	10	9	3	5	16	31	9	8	2	67.7	68.5	68.3	68.2	80.5	62.5	82.6	75.2	6.1	4.4	3.1	4.5	10	13	8	13	0	0	3	0	18 6	27, 28	14 6	21	4 0	16 5
Aug ...	9	29	15	2	14	17	2	2	3	68.7	68.2	68.5	68.5	85.2	66.5	85.0	78.9	6.0	5.6	3.9	5.2	10	11	10	10	0	0	3	0	19 0	13	14 6	21	4 6	16 7
Sept...	6	17	7	9	19	22	0	2	8	64.2	62.8	64.2	63.7	84.0	54.1	80.1	72.7	2.7	3.1	1.2	2.3	20	8	2	2	0	0	0	0	18 3	12, 26	14 3	17	4 0	16 5
Oct....	16	19	11	8	11	17	3	6	2	53.6	55.2	55.3	54.7	81.0	57.7	78.5	72.4	3.1	3.9	2.3	3.1	17	13	1	4	0	0	0	0	19 3	9	15 0	16, 31	4 3	16 6
Nov ...	18	20	8	3	6	8	10	15	2	41.9	43.0	44.2	43.0	81.7	59.1	75.3	72.0	3.8	4.1	4.3	4.1	15	7	8	7	0	0	0	0	19 0	24	14 9	2	4 3	17 0
Dec...	29	15	3	3	12	17	6	8	0	35.9	39.0	38.5	37.8	81.4	69.8	79.2	76.8	5.7	7.2	5.4	6.1	4	15	12	16	2	7	0	0	19 0	25	14 3	29	4 9	16 6
Sums .	170	196	82	77	146	196	66	93	72	607.2	610.7	615.2	611.0	966.8	732.8	935.2	878.1	60.4	63.4	46.4	56.7	129	139	98	125	6	36	10	8	......	......	......	....	47 3	199 9
	Percentages.																					Percentages.													
Means .	15.5	17.9	7.5	7.0	13.3	17.9	6.0	8.5	6.6	50.6	50.9	51.3	50.9	80.6	61.1	77.9	73.2	5.0	5.3	3.9	4.7	35.2	38.0	26.8	34.2	1.6	9.8	2.7	2.2	19 6	*29	14 3	†17, ‡29	3 11.2	16 7.8

*May. †September. ‡December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.03 a. m., 3.03 p. m., and 11.03 p. m., local time.

Correction for instrumental error of barometer used: From 7.03 a. m., January 1, to 11.03 p. m., December 31, 1884, inclusive, + .012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

JAMES. P. SHERRY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NORTH PLATTE, NEBR.

Location of office on December 31, 1884, southwest corner Fifth and Spruce streets.

[Latitude, 41° 8′ N.; longitude, 100° 45′ W. Elevation of barometer above sea-level, 2,841 feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.	27.170	27.141	27.171	27.161	27.642	4	26.650	9	.992	13.1	27	18.2	19.4	48.8	28	− 9.0	4	57.8	32.7	8.9	.10	.04	14	34	NW.	10	W.	5,983
Feb	27.054	27.019	27.057	27.043	27.360	11	26.816	18	1.044	14.2	27.1	17.8	19.7	59.0	24	−20.0	13	79.0	31.6	9.4	.23	.09	5, 6	34	NW.	29	NW.	5,437
Mar	26.973	26.947	26.964	26.961	27.345	14	26.184	10	1.161	27.4	40.9	33.7	34.0	65.0	28 30	−1.0	9	66.0	45.0	25.4	1.82	.75	31	38	NE.	31	NW.	6,723
Apr.	26.999	27.000	27.020	27.006	27.438	20	26.525	1	.913	37.8	51.2	44.4	44.5	70.5	24	25.0	2 20	45.5	54.9	36.3	2.14	.65	26	47	NW.	1	N.	8,967
May	27.066	27.043	27.058	27.056	27.343	7	26.669	4	.674	50.2	66.4	57.2	57.9	88.0	9	32.0	2	56.0	69.1	43.4	2.40	.68	4, 5	42	NW.	5	E. SE	7,635
June	27.090	27.064	27.071	27.075	27.257	18	26.758	11	.499	62.7	80.1	69.6	70.8	94.0	30	49.0	9	45.0	82.5	60.8	1.89	.80	15	47	SE.	7	SE.	6,814
July	27.069	27.037	27.043	27.050	27.278	9	26.857	22	.421	65.5	83.2	72.0	73.6	97.0	7	54.0	31	43.0	84.9	63.3	2.19	.85	18	47	N.	18	SE.	7,184
Aug	27.136	27.112	27.119	27.122	27.383	9	26.769	19	.614	60.1	77.8	67.3	68.4	92.0	28	48.0	30	44.0	79.0	58.3	2.13	.56	7, 17	36	SE.	1	SE.	6,535
Sept.	27.013	26.987	27.001	27.000	27.413	19	26.658	2	.755	55.5	75.6	63.7	64.9	91.0	2	40.0	17	51.0	77.2	58.6	.08	.07	23	36	E, S.	8 25	SE.	8,560
Oct.	27.141	27.093	27.119	27.115	27.442	23	26.719	2	.723	44.7	66.1	53.1	54.6	83.0	2 18 19	26.0	23	57.0	67.9	42.8	.74	.40	5	45	SW.	5	SE.	7,307
Nov*	27.107	27.135	27.173	27.158	27,460	5	26.758	26	.702	27.1	50.2	35.5	37.6	67.0	8	4.5	28	62.5	51.6	25.1	.04	.03	17	28	N., NW.	28 29	W.	4,458
Dec	27.090	27.047	27.100	27.082	27.561	24	26.625	21	.936	11.6	23.3	14.5	16.5	65.0	1	−18.0	22	83.0	25.3	7.3	.27	.07	29, 30	37	SE.	19	W.	5,695
Sums	324.968	324.925	324.925	324.832	....	...	....	...	9.494	469.9	668.9	54.7	561.9	.....	.....	....	...	689.8	701.7	439.6	18.53	....	....	...	....	...	....	81,298
Means	27.081	27.052	27.075	27.060	27.642	†4	26.184	‡10	.786	39.2	55.7	45.6	46.8	97.0	§7	−20	‖13	57.5	58.5	36.6	.....	....	....	...	....	...	SE.	......

* One 7 a. m. observation taken late. † January. ‡ March. § July. ‖ February.

NORTH PLATTE, NEBR.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	2	5	1	8	4	0	40	21	12	7.9	16.3	12.2	12.1	79.9	65.8	77.6	74.3	3.5	3.2	3.4	3.4	15	12	4	4	12	30	0	0	0
Feb	6	9	0	7	1	6	14	24	20	8.4	14.6	12.3	11.8	76.7	61.7	79.1	72.5	4.8	5.3	4.0	4.7	11	10	8	9	15	27	0	0	0
Mar	9	14	12	9	4	1	9	19	16	22.2	29.4	27.9	26.5	80.1	66.5	79.8	75.5	5.7	6.6	4.9	5.7	6	16	9	13	4	21	0	0	0
Apr	18	5	10	17	5	4	6	17	8	31.3	35.0	35.8	34.0	77.2	57.0	73.2	69.1	5.7	5.5	4.8	5.3	5	19	6	12	0	11	0	0	0
May	7	3	18	18	10	4	11	14	8	44.3	45.8	49.0	46.4	80.7	50.9	74.7	68.8	3.9	5.2	3.1	4.1	11	17	3	12	0	0	0	2	0
June	2	4	16	37	11	3	5	5	7	57.6	60.1	61.2	59.6	84.0	51.9	75.2	70.4	4.1	4.7	2.9	3.9	11	17	2	8	0	0	3	3	0
July	8	10	19	24	12	0	6	7	7	60.7	63.2	62.8	62.2	85.0	53.5	74.1	70.9	5.4	4.1	4.4	4.6	7	19	5	10	0	0	5	3	0
Aug	7	6	8	29	13	2	7	13	8	55.4	59.2	58.8	57.8	85.4	55.3	75.8	72.2	4.0	3.6	3.1	3.6	14	13	4	11	0	0	1	1	0
Sept	11	2	14	19	15	2	8	12	7	49.1	50.1	52.2	50.5	80.0	43.3	67.3	63.5	4.4	2.8	2.6	3.3	14	15	1	2	0	0	1	0	0
Oct	10	4	8	21	17	4	8	12	9	37.4	43.9	42.6	41.3	75.8	48.2	68.9	64.3	4.2	4.0	2.8	3.7	14	12	5	7	0	6	0	0	0
Nov	9	0	7	5	5	12	23	14	14	20.5	29.6	27.0	25.7	75.4	49.5	72.0	65.6	2.6	4.7	2.9	3.4	16	9	4	2	2	25	0	0	0
Dec	17	2	7	13	5	3	19	14	13	5.1	11.2	8.0	8.1	74.6	64.9	75.4	71.6	6.0	6.5	6.3	6.3	7	11	13	12	20	31	0	0	0
Sums	106	64	120	207	102	41	156	172	129	399.9	458.4	449.8	436.0	954.8	668.5	892.6	838.7	54.3	56.2	45.2	52.0	131	170	64	102	53	151	10	9	...
	Percentages.																					Percentages.								
Means	9.7	5.8	10.9	18.9	9.3	3.7	14.2	15.7	11.8	33.3	38.2	37.5	36.3	79.6	55.7	74.4	69.9	4.5	4.7	3.8	4.3	35.9	46.6	17.5	27.9	14.5	41.3	2.7	2.5	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.25 a. m., 1,25 p. m., and 9.25 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, —.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.120; February, 3.100; March, 3.060; April, 2.960; May, 2.870; June, 2.800; July, 2.800; August, 2.800; September, 2.880; October, 2.960; November, 3.060; December, 3.160.

REMARKS.—January, February, March, April, temperature lower than usual; deficiency in rainfall. May, unusually cold; season backward one month. June, marked deficiency in rainfall. July, August, September, October, November, December, the coldest for several years. A very marked deficiency in precipitation throughout year.

E. F. BRADY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

OLYMPIA, WASH.

Location of office, Fourth street.

[Latitude, 47° 3′ N.; longitude, 122° 53′ W. Elevation of barometer above sea-level, 36 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.080	30.101	30.074	30.085	30.518	22	29.410	26	1.108	37.8	40.6	39.0	39.1	54.0	4	28.0	30	26.0	44.7	35.2	5.47	1.77	3, 4	22	SW.	6	S.	1,320
Feb	30.015	30.020	30.000	30.012	30.564	26	29.278	17	1.286	30.2	36.5	35.2	34.0	59.1	29	2.0	11	57.1	42.1	27.5	4.17	1.12	23, 24	19	N.	10	S.	1,265
Mar	29.901	29.907	29.879	29.896	30.271	20	29.320	9	.951	36.6	45.5	45.0	42.4	64.0	31	25.0	7	39.0	52.5	34.4	1.57	.53	22	18	W.	10	N.	1,559
Apr	29.905	29.905	29.884	29.898	30.217	3	29.465	10	.752	44.0	56.0	53.1	51.0	76.0	7	35.0	27	41.0	61.7	41.6	3.60	.86	11	18	W.	11	S.	1,574
May	30.007	30.003	29.958	29.989	30.260	29	29.707	19	.553	45.8	61.9	60.5	56.1	87.0	31	36.0	28	51.0	70.1	43.9	1.46	.92	4, 5	19	SW.	5	N.	1,936
June	29.925	29.925	29.899	29.916	30.109	17	29.611	21	.498	50.0	63.4	62.2	58.5	87.0	1	40.0	14	47.0	71.5	48.9	3.20	1.48	26	42	SW.	24	N.	1,300
July	30.006	30.018	29.979	30.001	30.185	8	29.698	13	.487	52.4	66.2	65.0	61.2	84.0	13	43.0	4	41.0	73.0	50.5	.60	.23	18	16	SW.	5	N.	1,898
Aug	29.966	29.968	29.927	29.954	30.200	28	29.761	26	.439	57.2	69.8	70.0	65.7	92.0	3	47.0	16	45.0	77.8	54.4	.96	.37	26, 27	10	SW.	{12} {14}	N.	1,225
Sept	29.967	29.971	29.954	29.964	30.266	26	29.644	7	.622	50.6	57.9	56.2	54.9	70.0	1	41.0	26	29.0	62.9	48.6	3.06	.83	10	17	SW.	1	SW.	1,641
Oct	30.004	30.017	30.003	30.008	30.410	26	29.426	12	.984	46.7	53.8	49.8	50.1	66.5	17	34.5	3	32.0	58.8	43.7	4.30	.98	7, 8	19	S.	8	S.	1,723
Nov	30.056	30.066	30.051	30.058	30.363	26	29.797	6	.566	45.6	49.1	46.4	47.0	63.0	7	35.0	30	28.0	53.0	43.3	1.87	.35	24	14	S.	24	S.	569
Dec	29.925	29.932	29.925	29.927	30.446	6	29.167	19	1.279	30.1	35.1	32.9	32.7	54.0	8	8.0	29	46.0	39.5	28.0	5.82	3.32	18, 19	20	NE.	16	S.	1,870
Sums	359.757	359.833	359.533	359.708	....	...	....	...	9.525	527.0	635.8	615.3	592.7	......	...	....	...	482.1	707.6	500.0	35.58	....	......	...	....	....	....	17,880
Means	29.980	29.986	29.961	29.976	30.564	*26	29.167	†19	.794	43.9	53.0	51.3	49.4	92.0	‡3	2.0	*11	40.2	59.0	41.7	.....	....	......	...	....	....	S.	......

* February. † December. ‡ August.

OLYMPIA, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder storms.	Auroras.
1884.										°	°	°	°																	
Jan	4	1	0	1	23	3	0	1	60	34.1	34.3	34.2	34.2	86.7	78.9	83.2	82.9	7.8	9.3	6.9	7.8	2	10	19	15	0	7	0	0	0
Feb	11	9	1	0	16	3	2	0	45	26.2	29.2	30.1	28.5	84.7	75.1	81.4	80.4	5.4	6.0	5.7	5.7	8	11	10	14	2	17	0	0	0
Mar	13	2	0	1	12	5	7	6	47	32.7	38.1	39.7	36.8	85.8	75.5	82.1	81.1	5.5	6.6	3.9	5.3	10	10	11	18	0	8	0	2	2
Apr	8	1	0	0	17	14	3	4	43	40.5	45.8	46.0	44.1	87.8	69.7	77.3	78.3	4.5	6.1	4.7	5.1	10	9	11	18	0	0	0	0	0
May	20	3	0	0	12	15	3	3	37	42.4	47.3	47.9	45.9	88.1	60.3	64.5	71.0	4.8	5.3	3.5	4.5	11	12	8	8	0	0	0	0	0
June	17	0	1	.0	8	9	7	4	44	47.1	51.4	51.5	50.0	89.8	65.7	69.4	75.0	5.9	6.8	6.0	6.2	5	13	12	14	0	0	0	2	0
July	16	4	1	0	14	6	18	6	33	49.4	53.2	53.8	52.0	89.6	63.4	67.1	73.4	3.7	6.5	4.4	4.9	8	16	7	6	0	0	0	0	0
Aug	24	0	0	0	8	8	5	3	45	52.9	53.6	55.5	54.0	85.8	57.9	61.3	68.3	3.1	3.8	3.0	3.3	17	9	5	9	0	0	2	1	0
Sept	11	0	0	2	13	17	5	2	40	46.3	49.2	49.8	48.4	85.7	73.4	79.4	79.5	6.1	7.7	5.5	6.4	4	18	13	14	0	0	0	0	1
Oct	8	3	0	1	25	10	3	2	41	42.4	47.0	45.6	45.0	85.4	78.6	85.9	83.3	6.0	7.2	4.5	5.9	7	12	12	17	0	0	0	0	0
Nov	7	2	2	1	18	0	0	0	60	43.0	44.8	43.9	43.9	90.6	85.4	91.1	89.0	6.5	8.3	8.0	7.6	2	11	17	17	0	0	0	0	0
Dec	9	7	0	0	18	6	4	0	49	26.5	29.0	28.4	28.0	86.0	78.4	83.3	82.6	7.8	7.4	5.8	7.0	3	14	14	19	9	19	0	0	0
Sums ..	148	32	5	6	184	96	52	31	544	483.5	522.9	525.9	510.8	1,046.0	862.3	926.0	944.8	66.6	81.0	61.9	69.7	87	140	139	159	11	51	2	3	3
	Percentages.																					Percentages.								
Means .	13.5	2.9	0.5	0.5	16.8	8.7	4.7	2.9	49.5	40.3	43.6	48.8	42.6	87.2	71.9	77.2	78.8	5.6	6.8	5.2	5.8	23.8	38.3	38.0	43.4	3.0	13.9	0.5	0.8	0.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.57 a. m., 11.57 a. m., and 7.57 p. m., local time.
Correction for instrumental error of barometer used: From 3.57 a. m., January 1, to 7.57 p. m., December 31, 1884, inclusive, +0.20 inch
The barometric observations may be reduced to sea level by adding the following constants for the various months: January 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.
REMARKS.—Last frost, May 28; first ice, December 6; first snow, December 13.

JNO. DASCOMB,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

OMAHA, NEBR.

Location of office on December 31, 1884, United States custom-house, corner of Fifteenth and Dodge streets.

[Latitude, 41° 16′ N.; longitude, 95° 56′ W. Elevation of barometer above sea-level, 1,113 feet. Elevation of exposed thermometer above ground, 50 feet. Elevation of rain-gauge above ground, 71 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	*Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.	29.038	29.005	29.016	29.020	29.585	4	28.382	9	1.203	11.8	20.9	18.3	17.0	47.2	29	−32.0	5	79.2	26.9	6.1	.73	.25	6	32	NW., N.	10 23	N.	7,214
Feb	28.905	28.870	28.897	28.891	29.295	9	28.146	18	1.149	14.1	24.4	19.6	19.4	55.0	1	−12.1	18	67.1	29.8	8.2	1.42	.44	4, 5	38	N.	21	N.	7,343
Mar	28.816	28.795	28.804	28.805	29.240	13	27.913	10	1.327	29.8	40.5	35.6	35.3	67.3	27	− 2.6	3	69.9	45.5	26.0	4.91	1.05	27, 28	24	NW., SE.	2, 27	N.	5,819
Apr.	28.780	28.765	28.792	28.779	29.192	20	28.091	26	1.101	42.0	53.1	47.4	47.5	75.0	17	25.3	8	49.7	56.5	39.2	3.38	1.50	9	24	N.	19	N.	4,876
May	28.816	28.788	28.800	28.801	29.103	29	28.395	5	.708	54.6	69.3	60.9	61.6	82.5	9	36.0	2	46.5	72.8	52.1	1.45	.80	17, 18	24	N.	18	N.	4,945
June	28.845	28.824	28.827	28.832	29.026	28	28.546	8	.480	66.5	79.3	71.0	72.3	93.4	30	52.8	10	40.6	83.2	63.1	6.11	1.72	21, 22	56	N.	25	SE., S.	5,285
July	28.788	28.767	28.773	28.776	29.057	20	28.558	4	.499	68.3	81.7	73.4	74.5	97.3	8	57.5	5	39.8	85.7	65.1	10.35	2.31	18, 19	42	N.	2	SE.	5,385
Aug	28.877	28.862	28.856	28.865	29.207	9	28.577	28	.630	64.2	76.8	69.8	70.3	88.1	19	53.0	21	35.1	79.5	61.9	7.07	2.81	12, 13	27	NW., SE.	8, 18	S.	5,644
Sept	28.789	28.751	28.772	28.771	29.196	20	28.368	28	.828	62.0	76.1	67.7	68.6	90.0	8	48.6	20	41.4	78.1	50.3	4.91	1.68	14	30	S., N.	8, 19	S.	6,657
Oct	28.925	28.889	28.913	28.909	29.289	23	28.615	31	.674	51.1	64.6	56.3	57.3	84.5	3	29.8	23	54.7	68.1	47.5	5.81	3.78	3, 4	31	N., SW.	7, 19	S.	7,125
Nov	28.936	28.921	28.938	28.932	29.342	5	28.458	26	.884	33.5	45.2	39.3	39.3	63.0	12 15	2.0	23	61.0	50.6	29.5	.82	.30	22	36	NW.	23	N.	5,372
Dec′	28.961	28.939	28.975	28.958	29.517	24	28.424	8	1.093	14.5	21.0	16.4	17.3	54.0	1	−17.0	22	71.0	25.4	9.6	.72	.20	28, 29	29	N.	30	N.	6,662
Sums	346.476	346.176	346.363	346.339	......	...	....	...	10.576	512.4	652.9	575.7	580.4	....	....	....	...	656.0	701.6	467.6	47.68	....	......	...	....	....	....	72,527
Means	28.873	28.848	28.864	28.862	29.585	*4	27.913	†10	.881	42.7	54.4	48.0	48.4	97.3	‡8	—32.0	*5	54.7	58.5	39.0	.....	....	......	...	....	....	N.	......

*January. †March. ‡July.

OMAHA, NEBR.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									River.											
										Washington time.																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.		Date.	Lowest.		Date.	Range.		Mean.			
1884.										°	°	°	°																		Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.		
Jan ..	28	3	1	6	21	13	6	13	2	5.9	11.1	11.5	9.5	73.3	65.4	70.0	69.6	3.6	4.5	3.5	3.9	13	18	5	6	14	30	0	0	0	Frozen.											
Feb	33	4	2	5	14	2	8	14	5	7.7	13.7	13.2	11.5	75.1	64.8	76.3	72.1	5.0	6.3	5.4	5.6	6	14	9	13	16	27	0	0	0												
Mar ...	25	9	6	16	10	7	6	10	4	24.3	28.9	28.2	27.1	79.9	65.0	75.0	73.8	5.8	7.4	5.1	6.1	5	17	9	12	5	15	0	2	0	*15	6	24	7	0	20, 21	8	6	10	3.2		
Apr ...	24	8	2	22	6	7	2	13	6	37.0	38.6	39.1	38.2	82.4	59.8	73.9	72.0	5.8	7.1	5.5	6.1	9	7	14	17	0	4	0	3	0	17	0	6	7	5	26–28	9	7	10	6.1		
May ...	19	3	7	16	18	4	7	13	6	49.0	51.3	51.4	50.6	81.8	54.2	72.0	69.3	4.9	5.9	4.3	5.0	8	15	8	12	0	0	0	4	0	8	11	31	7	0	21, 22 23, 24	1	11	7	9.9		
June ..	11	6	3	28	28	5	2	3	4	62.4	63.4	64.2	63.8	86.8	59.7	79.6	75.4	4.0	5.8	3.6	4.5	7	19	4	8	0	0	4	3	0	14	7	22	9	6	1	5	1	12	3.8		
July ...	22	11	5	23	15	7	1	6	3	63.7	65.7	66.4	65.8	85.6	59.6	79.7	75.0	5.0	4.5	4.2	4.6	10	15	6	17	0	0	7	8	0	13	8	4	9	0	26	4	3	10	6.6		
Aug ...	13	3	2	23	24	13	2	12	1	60.0	61.2	62.5	61.2	86.5	60.2	78.2	75.0	2.9	5.3	3.0	3.7	15	12	4	9	0	0	0	2	0	9	0	1	7	3	11, 12 22–24	1	9	7	8.3		
Sept ...	11	3	2	20	36	3	2	12	1	57.1	60.6	60.9	59.5	84.4	60.4	79.6	74.8	3.6	5.7	3.7	4.3	13	11	6	9	0	0	0	6	0	7	8	10, 11 14–16	7	1	9		7	7	5.2		
Oct	18	0	2	11	38	7	3	13	1	44.5	48.0	47.1	46.5	78.4	57.3	72.3	69.3	3.6	4.5	3.2	3.8	15	10	6	9	0	2	0	2	0	8	0	4, 5	6	10	23, 24	1	2	7	3.3		
Nov ...	34	0	1	7	23	9	2	11	3	28.7	33.0	32.0	31.2	82.2	63.2	75.5	73.6	3.7	5.2	3.6	4.2	14	9	7	2	1	16	0	0	2	6	11	1–7	4	7	27	2	4	6	3.1		
Dec	38	2	1	8	12	3	5	18	5	9.7	12.7	11.1	11.2	81.1	71.1	80.2	77.5	5.9	6.6	5.7	6.1	5	15	11	13	20	28	0	0	0	†5	11	8	4	0	16	1	11	5	2.1		
Sums .	276	53	34	185	245	80	46	138	41	450.0	488.2	487.6	475.1	977.5	740.7	912.8	876.9	53.8	68.8	50.8	57.9	120	157	89	127	56	122	11	30	2	......		......	......		......	......		......			
	Percentages.																					Percentages.																				
Means.	25.1	4.8	3.1	16.8	22.3	7.3	4.2	12.6	8.7	37.5	40.7	40.6	39.6	81.5	61.7	76.0	73.1	4.5	5.7	4.2	4.8	32.8	42.9	24.3	34.7	15.3	33.3	3.0	8.2	.5	......		......	......		......	......		......			

* For 13 days.

† For 16 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.44 a. m., 1.44 p. m., and 9.44 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.007 inch

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.27; February, 1.27; March, 1.25; April, 1.21 May, 1.16; June, 1.14; July, 1.13; August, 1.14; September, 1.17; October, 1.20; November, 1.24; December, 1.29.

REMARKS.—January 5, coldest day on record.

ALEXANDER POLLAK,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

OSWEGO, N. Y.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 43° 29′ N.; longitude, 76° 35′ W. Elevation of barometer above sea-level, 334 feet. Elevation of exposed thermometer above ground, 74 feet. Elevation of rain-gauge above ground, 83 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	8 p. m.	11 p. m.							7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.723	29.695	29.704	29.707	30.514	27	28.787	9	1.727	20.7	24.0	20.9	21.9	45.8	31	−3.6	26	49.4	29.1	13.5	6.49	1.50	8, 9	41	W.	8	S.	8,806
Feb	29.666	29.663	29.693	29.674	30.277	16	28.996	28	1.281	28.2	30.9	29.5	29.2	51.5	5	6.8	29	44.7	37.8	21.7	2.98	.52	17, 18	38	W.	28	SE.	8,007
Mar	29.660	29.645	29.668	29.658	30.031	18	29.133	26	.898	29.7	33.3	31.4	31.5	56.0	25	7.5	2	48.5	39.2	26.6	3.81	.93	19, 20	32	N.	29	SE.	7,446
Apr	29.551	29.529	29.545	29.542	30.008	21	28.925	2	1.083	39.0	42.7	41.0	40.9	78.0	27	29.2	6	48.8	48.5	36.4	.88	.88	15, 16	30	NE.	21	NW.	6,053
May	29.570	29.555	29.566	29.564	29.912	3	29.222	13	.690	51.2	56.6	52.0	53.3	83.0	23	37.0	{3 {16	46.0	64.4	45.6	2.39	.40	9	33	W.	2	W.	6,845
June	29.745	29.711	29.705	29.720	30.139	15	29.376	24	.763	63.4	69.6	63.8	65.6	90.2	23	49.3	10	40.9	77.6	58.1	1.48	.67	11	28	NE.	25	S.	4,457
July	29.500	29.476	29.480	29.488	29.682	3	29.199	31	.483	62.9	67.4	63.2	64.5	88.5	1	54.2	{7 {26	34.3	74.2	59.1	1.90	.80	4, 5	23	W.	{5 {31	W.	5,831
Aug	29.676	29.646	29.659	29.660	29.972	9	29.217	29	.755	64.3	72.3	65.7	67.4	93.3	21	44.4	25	48.9	77.6	59.4	1.71	1.02	29	26	S.	26	S.	5,683
Sept	29.708	29.674	29.690	29.691	30.138	14	29.302	28	.836	60.8	69.8	63.1	64.4	91.8	4	40.5	14	51.3	75.3	56.5	1.92	.89	28	30	S.	24	S.	6,610
Oct	29.736	29.712	29.724	29.724	30.225	26	29.278	6	.952	48.0	53.8	49.1	50.3	80.1	4	25.6	26	54.5	61.9	43.0	3.21	.52	17, 18	35	NW.	25	SE., S.	8,612
Nov	29.663	29.627	29.655	29.648	30.085	3	29.017	28	1.018	34.5	39.8	36.4	36.9	62.3	23	17.5	25	44.8	46.0	30.5	2.09	.49	28, 29	38	W.	24	SE.	9,720
Dec	29.742	29.710	29.722	29.723	30.354	26	28.962	6	1.392	25.8	29.4	27.4	27.5	58.4	31	−17.5	20	75.9	34.7	20.6	2.61	1.16	6, 7	44	W.	23	SE.	10,638
Sums ..	355.940	355.643	355.820	355.801	......	...	....	...	11.878	528.5	589.1	542.5	553.4	....	....	......	...	588.0	666.8	471.0	31.47	....	......	...	....	....	....	88,208
Means .	29.662	29.637	29.652	29.650	30.514	*27	28.787	*9	.990	44.0	49.1	45.2	46.1	93.3	†21	−17.5	‡20	49.0	55.5	39.2	.....	....	......	...	....	....	S.	......

* January. † August. ‡ December.

OSWEGO, N. Y.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	7	11	4	15	21	12	13	10	0	10.0	12.6	11.7	11.4	66.6	63.4	66.9	65.6	9.5	8.9	8.0	8.8	0	8	23	23	18	31	0	0	0
Feb......	7	14	1	19	16	4	12	14	0	21.3	23.0	21.0	21.8	75.1	73.1	74.0	74.1	9.6	9.4	8.9	9.3	0	2	27	24	8	24	0	0	0
Mar	14	11	3	17	10	6	16	15	1	22.9	26.0	24.6	24.5	76.5	75.4	75.9	75.9	6.9	6.7	5.8	6.5	4	15	12	17	8	20	0	0	1
Apr	21	9	4	6	8	5	12	22	3	32.5	32.4	33.9	32.9	77.9	69.4	76.7	74.7	5.9	6.2	6.5	6.2	4	13	13	11	0	3	0	0	0
May	9	4	2	19	15	9	25	8	2	44.1	44.7	45.2	44.7	77.4	66.5	78.2	74.0	5.4	5.8	5.5	5.6	8	13	10	16	0	0	0	2	0
June.....	16	12	3	4	23	6	18	5	3	56.4	55.6	57.3	56.4	78.3	62.8	79.9	73.7	3.9	3.7	2.6	3.4	15	9	6	5	0	0	1	3	1
July	9	4	0	7	18	5	38	11	1	57.0	57.3	57.5	57.3	81.9	71.2	82.1	78.4	5.5	5.4	5.6	5.5	6	17	8	10	0	0	0	5	1
Aug	10	4	1	18	21	10	17	11	1	57.1	56.5	57.0	56.9	78.1	59.4	74.5	70.7	3.7	3.8	2.8	3.4	15	10	6	8	0	0	2	5	0
Sept	9	4	1	18	23	10	14	10	1	53.2	54.1	54.0	53.8	77.1	60.8	73.6	70.5	5.7	4.0	4.5	4.7	8	16	6	12	0	0	1	4	3
Oct	9	2	1	22	22	10	16	11	0	40.2	41.4	40.7	40.8	75.4	65.6	75.1	72.0	7.4	7.2	5.5	6.7	4	11	16	16	0	3	0	3	1
Nov	5	4	3	20	14	13	19	11	1	27.8	31.5	28.9	29.4	76.6	73.0	74.7	74.8	7.8	8.0	7.8	7.7	4	4	22	17	2	15	0	0	0
Dec......	4	4	0	26	23	14	11	11	0	20.7	23.3	22.4	22.1	81.5	78.6	81.8	80.6	9.1	8.4	8.3	8.6	2	5	24	17	12	22	0	0	0
Sums ..	120	83	23	191	214	104	211	139	13	443.2	458.4	454.2	452.0	922.4	819.2	913.5	885.0	80.4	77.0	71.8	76.4	70	123	173	176	48	118	4	22	7
	Percentages.																					Percentages.								
Means .	10.9	7.6	2.1	17.4	19.5	9.5	19.2	12.7	1.2	36.9	38.2	37.8	37.6	76.9	68.3	76.1	73.8	6.7	6.4	6.0	6.4	19.1	33.6	47.3	48.1	13.1	32.2	1.1	6.0	1.9

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time.

Correction for instrumental error of barometer: From 7.02 a. m., January 1, to 11.02 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January 0.38; February, 0.38; March, 0.37; April, 0.37; May, 0.36; June, 0.35; July, 0.35; August, 0.35; September, 0.35; October, 0.36; November, 0.37; December, 0.38.

REMARKS.—Office was removed from Grant Block to room No. 33 on third floor of custom-house on August 1, 1884, at which time changes in the elevation of the instruments occurred as follows: Barometer, 30.500 feet higher in new than in old office. Thermometers: exposed, 39.483 feet higher from ground in new office; wet bulb, 39.483 feet higher from ground in new office; maximum, 39.680 feet higher from ground in new office; minimum, 39.739 feet higher from ground in new office; rain-gauge, 20.680 feet higher from ground in new office.

JULIUS G. LINSLEY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PALESTINE, TEX.

Location of office on December 31, 1884, third floor I. and G. N. general office.

[Latitude, 31° 45′ N.; longitude, 95° 40′ W. Elevation of barometer above sea-level, 533 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.724	29.675	29.711	29.703	30.107	20	29.264	10	.843	34.9	46.9	40.8	40.9	76.5	31	6.5	5	70.0	50.1	30.7	2.31	1.03	14	32	N.	24	S.	5,861
Feb	29.524	29.513	29.534	29.524	29.906	14	29.137	18	.769	48.2	58.3	52.3	52.9	77.5	4	17.6	14	59.9	68.0	43.1	2.47	1.32	11, 12	36	NW., N.	19 27	S.	8,467
Mar	29.471	29.433	29.454	29.453	29.861	9	29.135	23	.726	53.1	66.5	61.5	60.4	80.0	5	31.8	9	48.2	70.2	50.9	3.62	2.21	17	36	S.	11	S.	8,056
Apr	29.429	29.406	29.409	29.415	29.701	9	29.032	14	.669	55.6	68.0	62.6	62.1	82.3	28	38.4	23	43.9	71.9	53.6	7.30	2.87	18, 19	40	S.	1	S.	7,412
May	29.443	29.423	29.435	29.434	29.649	9	29.265	21	.384	63.7	76.5	68.3	69.5	84.9	15 18	52.6	2	32.3	79.3	61.7	17.25	5.68	21, 22	32	N.	17	S.	5,455
June	29.459	29.430	29.430	29.440	29.607	28	29.295	24	.312	70.7	85.1	76.0	77.3	92.0	24 25	60.4	4	31.6	87.3	68.4	2.65	1.23	3	20	SW.	19	S.	3,771
July	29.455	29.430	29.416	29.434	29.583	6	29.317	16	.266	76.1	91.6	82.4	83.4	98.2	9	68.4	12	29.8	94.0	74.3	.06	.05	14	28	S.	30	S.	6,203
Aug	26.515	29.480	29.463	29.433	29.654	4	29.323	29	.331	71.7	89.2	79.3	80.1	97.9	29	62.0	12	35.9	91.4	70.3	.66	.60	4	26	S.	1	S.	5,880
Sept	29.480	29.438	29.462	29.460	29.688	20	29.218	23	.475	72.2	88.5	78.1	79.6	95.0	7	61.4	2	33.6	90.3	70.7	4.00	2.25	25	27	E.	3	S.	5,786
Oct	29.592	29.553	29.534	29.576	29.827	24	20.389	26	.438	60.2	74.9	65.2	66.8	89.1	6	46.1	28	43.0	77.0	58.8	1.45	.95	25, 26	20	SE.	25	NE.	5,501
Nov	29.626	29.580	29.616	29.607	30.004	6	29.122	22	.882	47.4	62.7	53.4	54.5	77.6	2	32.1	20 24	45.5	64.7	45.2	2.93	1.92	22	24	S.SE., NW.	17 22 28	S.	5,934
Dec	29.519	29.485	29.525	29 510	29.936	25	29.088	4	.848	40.0	50.0	45.8	45.1	76.2	4	15.2	25	61.0	56.4	35.6	6.94	3.57	10, 11	34	S.	4	NE.	7,296
Sums ..	354.237	353.846	354.050	354.640	......	...	......	...	6.948	693.8	858.2	765.2	772.6	....	...	......	...	534.7	895.6	668.8	51.64	....	......	...	....	...	....	75,572
Means	29.520	29.487	29.505	29.504	30.107	*20	29.032	†14	.579	57.8	71.5	63.8	64.4	98.2	‡9	6.5	*5	44.6	74.6	55.3	......	....	......	...	....	...	S.	......

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* January.

† April.

‡ July.

PALESTINE, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	13	9	7	2	27	8	4	20	3	27.7	32.7	30.0	30.1	75.0	60.1	66.7	67.3	4.8	5.4	3.6	4.6	10	16	5	9	3	16	0	0	0
Feb	20	6	2	3	41	1	3	11	0	41.7	42.2	41.9	41.9	78.7	60.8	69.5	69.7	5.8	5.5	3.9	5.1	10	10	9	10	0	6	0	2	0
Mar	12	16	3	11	29	6	3	13	0	46.1	48.7	47.4	47.4	78.3	57.5	62.8	66.2	5.7	5.8	4.3	5.3	7	15	9	8	0	1	0	2	0
Apr	10	15	5	12	21	6	4	17	0	51.6	53.7	53.3	52.9	87.0	64.1	73.9	75.0	6.9	6.6	3.9	5.8	6	14	10	13	0	0	0	2	0
May	11	28	3	6	30	2	5	8	0	61.2	64.9	63.1	63.1	91.6	69.2	84.5	81.8	5.5	6.2	4.2	5.3	5	18	8	15	0	0	0	4	0
June	9	16	13	13	18	7	3	5	6	67.9	69.4	69.5	68.9	91.0	60.1	80.8	77.3	4.2	4.7	3.1	4.0	12	16	2	6	0	0	8	7	0
July	2	7	4	5	61	9	0	1	4	73.9	75.2	73.8	74.3	93.2	59.3	75.7	76.1	3.9	3.4	.6	2.6	19	12	0	2	0	0	31	1	0
Aug	11	22	8	15	33	3	0	0	1	67.9	66.9	67.5	67.4	88.3	49.7	68.3	68.8	2.5	2.8	.6	2.0	22	8	1	2	0	0	20	1	0
Sept	6	9	17	21	35	1	1	0	0	69.7	67.6	68.0	68.4	92.4	51.2	72.8	72.1	3.2	4.9	2.1	3.4	17	9	4	7	0	0	20	8	0
Oct	10	32	14	20	6	3	3	4	1	57.1	56.8	58.6	57.5	90.0	55.5	80.3	75.3	3.7	3.5	1.6	2.9	17	11	3	7	0	0	0	0	0
Nov	12	13	4	14	25	3	4	15	0	41.5	44.4	43.1	43.0	80.5	53.2	68.3	67.3	3.7	3.3	2.3	3.1	17	8	5	5	0	0	0	2	0
Dec	11	25	8	5	18	7	8	11	0	34.6	37.3	37.0	36.3	81.5	65.3	74.1	73.6	5.7	6.4	5.6	5.9	7	13	11	11	2	13	0	8	0
Sums	127	198	88	127	344	56	38	105	15	640.9	659.8	653.2	651.2	1,027.5	706.0	877.7	870.5	55.6	58.5	35.8	50.0	149	150	67	95	5	36	79	37	0
	Percentages.																					Percentages.								
Means	11.6	18.0	8.0	11.6	31.3	5.1	3.5	9.6	1.4	53.4	55.0	54.4	54.3	85.6	58.8	73.1	72.5	4.6	4.9	3.0	4.2	40.7	41.0	18.3	26.0	1.4	9.8	21.6	10.1	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.46 a. m., 1.46 p. m., and 9.46 p. m., local time.
Correction for instrumental error of barometer used: From 5.46 a. m., January 1, to 9.46 p. m., December 31, 1884, inclusive, —.001 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.580; February, 0.580; March, 0.570; April, 0.560; May, 0.550; June, 0.540; July, 0.540; August, 0.540; September, 0.550; October, 0.560; November, 0.570; December, 0.580.

JNO. A. GUZMAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PENSACOLA, FLA.

Location of office on December 31, 1884, southwest corner Palafox and Saragossa streets.

[Latitude, 30° 25′ N.; longitude, 87° 13′ W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.					
	Washington time.									Washington time				Self-registering thermometer.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.240	30.191	30.228	30.220	30.674	21	29.811	23	.863	41.9	51.4	45.8	46.4	71.3	11	16.3	6	55.0	56.1	37.0	3.69	1.75	7, 8	28	N.	5	N.	6,510
Feb	30.109	30.070	30.091	30.090	30.345	15	29.710	27	.635	54.0	64.3	58.5	58.9	74.3	9	29.0	29	45.3	67.6	51.9	3.43	1.83	17	30	S.	19	SE.	5,300
Mar	30.048	30.018	30.043	30.036	30.340	15	29.765	1	.575	58.7	68.2	62.5	63.1	82.7	29	37.5	1	45.2	70.2	56.4	5.75	3.88	12, 13	31	S.	1	S.	6,552
Apr	29.971	29.937	29.956	29.955	30.181	29	29.657	5	.524	61.6	72.0	65.2	66.3	83.0	2	44.7	24	38.3	74.2	59.6	5.67	2.10	20, 21	24	NE., S.	5–15	S.	6,325
May	29.987	29.962	29.975	29.975	30.167	23	29.778	27	.389	70.6	79.4	72.5	74.2	86.9	24	60.3	9	26.6	81.9	68.1	6.64	3.97	5	22	SW., E.	11–30	SW.	5,344
June	29.971	29.938	29.962	29.957	30.147	1	29.720	10	.427	73.6	81.2	75.0	76.6	91.6	22	64.1	12	27.5	83.8	70.7	7.84	1.41	14, 15	23	W.	10	SW.	5,401
July	29.975	29.958	29.966	29.966	30.114	24	29.764	10	.350	78.1	84.0	79.4	80.5	97.2	20	69.1	8	28.1	87.9	75.2	8.79	2.50	15, 16	24	NW., SW.	16–29	SW.	5,218
Aug	30.015	29.982	30.012	30.003	30.162	20	29.806	31	.356	75.3	86.6	78.7	80.2	94.0	28	66.4	7	27.6	88.6	73.6	2.07	1.20	3, 4	24	NW.	8	S.	4,885
Sept	30.034	30.005	30.031	30.023	30.193	15	29.862	11	.331	74.9	84.6	79.0	79.5	93.5	11	65.0	17	28.5	86.7	73.7	4.83	2.25	5, 6	21	NE.	6	SE.	3,964
Oct	30.094	30.048	30.082	30.075	30.334	25	29.883	8	.451	68.5	80.4	72.5	73.8	95.2	8	46.2	24	49.0	82.1	67.4	2.43	1.62	26, 27	24	SE., S.	26–27	NE., SE.	4,822
Nov	30.120	30.073	30.113	30.102	30.354	6	29.641	28	.713	50.9	66.0	55.9	57.6	75.7	4	39.7	24	36.0	67.8	48.6	5.16	3.21	22, 23	32	S.	23	N.	4,597
Dec	30.109	30.064	30.105	30.093	30.384	19	29.686	5	.698	52.2	60.4	55.4	56.0	73.6	11	23.0	19	50.6	63.7	48.6	5.60	1.31	13	24	SE., N.	5–18	E.	6,294
Sums	360.673	360.246	360.564	360.495	......	...	......	...	6.312	760.3	878.5	800.4	818.1	....	...	....	....	457.7	910.6	730.8	61.90	.....	.....	...	....	.....	....	65,212
Means	30.056	30.020	30.047	30.041	30.674	*21	29.641	†28	.526	63.4	73.2	66.7	67.8	97.2	‡20	16.3	*6	38.1	75.9	60.9	.....	.....	.....	...	....	.....	S.	......

* January. † November, ‡ July.

PENSACOLA, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	28	19	9	12	5	3	2	15	0	35.3	37.5	36.8	36.5	77.4	62.6	71.7	70.6	6.2	5.7	5.4	5.8	6	14	11	13	0	12	0	1	0
Feb	11	5	8	24	16	9	7	7	0	49.4	50.7	51.5	50.5	85.2	66.6	80.5	77.4	4.0	5.5	3.8	4.4	12	8	9	11	0	1	0	4	0
Mar	11	6	4	17	24	15	5	10	1	54.0	54.6	56.6	55.1	85.6	67.0	82.8	78.5	6.5	5.8	5.4	5.9	6	14	11	11	0	0	0	3	0
Apr	9	6	5	11	19	17	8	14	1	55.7	54.8	57.4	56.0	81.9	58.3	77.8	72.5	4.7	4.8	4.4	4.6	13	11	6	8	0	0	0	3	0
May	8	5	3	19	12	32	4	10	0	66.4	65.8	66.5	66.2	87.0	64.9	82.2	78.0	4.3	5.3	3.0	4.2	14	10	7	9	0	0	0	8	0
June	4	6	7	8	17	23	5	13	7	69.0	68.6	69.8	69.1	85.7	67.8	84.3	79.1	5.8	6.4	4.8	5.7	3	18	9	17	0	0	2	17	0
July	9	2	2	3	16	31	18	5	7	73.9	73.5	74.1	73.8	87.5	72.7	84.5	81.6	4.5	6.4	2.7	4.5	9	18	4	19	0	0	6	20	0
Aug	9	19	3	13	29	9	3	8	0	70.5	71.7	71.9	71.4	85.5	61.8	80.2	75.8	3.6	5.2	2.8	3.9	13	14	4	11	0	0	9	11	0
Sept	3	15	18	27	12	3	2	0	10	70.6	71.0	71.7	71.1	87.0	65.1	79.1	77.1	2.6	4.8	1.2	2.9	17	13	0	7	0	0	4	3	0
Oct	12	21	11	21	11	4	2	4	7	61.2	62.4	61.1	61.6	78.6	56.9	69.6	68.4	3.4	3.7	2.4	3.2	19	8	4	5	0	0	2	0	0
Nov	35	18	7	4	8	3	1	7	7	43.2	46.3	44.8	44.8	75.7	52.6	67.7	65.3	3.9	3.9	2.9	3.6	15	11	4	7	0	0	0	1	0
Dec	20	12	25	7	8	7	3	8	3	48.0	51.2	50.2	49.8	86.1	74.8	83.5	81.5	6.2	6.4	5.4	6.0	7	11	13	12	0	2	0	0	0
Sums ..	159	134	102	166	177	156	60	101	43	697.2	708.1	712.4	705.9	1003.2	770.6	943.4	905.8	55.7	63.9	44.2	54.7	134	150	82	130	0	15	23	71	0
	Percentages.																					Percentages.								
Means .	14.5	12.2	9.3	15.1	16.1	14.2	5.5	9.2	3.9	58.1	59.0	59.4	58.8	83.6	64.2	78.6	75.5	4.6	5.3	3.7	4.5	36.6	41.0	22.4	35.5	0	4.1	6.3	19.4	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.19 a. m., 2.19 p. m., and 10.19 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + 0.04 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

REMARKS.—Last frost of spring, March 1; first frost of autumn, November 21.

M. McGAURAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PHILADELPHIA, PA.

Location of office on December 31, 1884, post-office building.

[Latitude, 39° 57′ N.; longitude, 75° 9′ W. Elevation of barometer above sea-level, 117 feet. Elevation of exposed thermometer above ground, 174 feet. Elevation of rain-gauge above ground, 166 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.052	30.003	30.024	30.026	30.757	27	29.002	9	1.755	26.4	32.2	30.0	29.5	55.0	9	10.0	5, 7	45.0	36.8	23.5	5.46	1.40	8, 9	25	NE.	9	SW.	6,098
Feb	29.961	29.950	30.002	29.971	30.624	16	29.109	28	1.455	38.6	43.0	39.4	40.3	65.0	6	10.5	29	54.5	47.4	32.8	5.70	1.06	23	35	NW.	20	NE.	6,239
Mar	29.941	29.881	29.930	29.917	30.343	16	29.393	26	.950	37.2	45.9	41.3	41.5	66.0	12	12.0	1	54.0	48.3	35.4	4.70	1.64	19, 20	34	NW.	30	NW.	6,452
Apr	29.776	29.710	29.773	29.753	30.106	12	29.097	2	1.009	44.8	54.9	46.4	48.7	74.0	27	33.0	6	41.0	57.3	40.9	1.63	.78	2	37	NW.	10	NW.	8,012
May	29.859	29.809	29.855	29.841	30.194	31	29.496	11	.698	57.2	68.3	58.4	61.3	88.0	24	41.5	29	46.5	71.0	53.1	3.39	1.10	13, 14	35	NE.	7	SW.	7,500
June	29.985	29.948	29.966	29.966	30.417	15	29.624	10	.793	65.4	79.1	66.9	70.5	94.8	22	47.2	15	47.6	82.3	60.8	3.00	2.50	25, 26	44	NE.	26	NE.	6,488
July	29.782	29.727	29.766	29.758	29.916	22	29.494	13	.422	67.8	78.5	69.1	71.8	92.0	23	58.9	9	33.1	80.9	63.9	3.83	1.79	4, 5	32	NE.	6	NW.	6,352
Aug	29.956	29.915	29.952	29.941	30.205	25	29.601	30	.604	68.4	78.9	70.1	72.5	95.4	20	53.6	25	41.8	81.8	65.6	4.30	1.95	4, 5	24	SW.	4	S.	5,041
Sept	30.029	29.965	30.007	30.000	30.391	14	29.634	17	.757	64.6	79.1	68.0	70.6	94.1	9	47.7	14	46.4	81.0	61.8	.20	.10	30	28	S.	16	S.	5,769
Oct	30.063	29.999	30.045	30.036	30.477	26	29.653	8	.824	52.8	64.3	55.1	57.2	83.7	4	31.7	26	52.0	67.5	48.8	1.54	.52	30	33	S.	22	N.	7,173
Nov	29.994	29.949	29.972	29.972	30.349	3	29.310	20	1.039	39.6	49.8	42.4	43.8	65.9	2	22.0	25	43.9	53.5	36.5	2.81	1.00	23, 24	36	NW.	29	N.	7,048
Dec	30.084	30.029	30.051	30.055	30.554	26	29.431	6	1.123	31.2	38.2	34.3	34.6	66.0	31	.8	20	65.2	41.2	28.2	3.28	1.22	21	40	S.	6	NW.	7,598
Sums ..	359.482	358.885	359.343	359.236	....	...	....	...	11.429	593.5	711.7	621.4	642.8	......	...	......	...	571.0	749.0	551.8	39.84	....	......	...	....	....	....	79,760
Means .	29.957	29.907	29.945	29.936	30.757	*27	29.002	*9	.952	49.5	59.3	51.8	53.5	95.4	‡20	.8	§20	47.6	62.4	45.9	.....	....	......	...	....	....	NW.	......

*January. ‡August. §December.

PHILADELPHIA, PA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	6	20	4	1	6	24	9	20	3	19.6	23.7	22.4	21.9	75.5	71.4	73.3	73.4	4.9	7.3	6.0	6.1	6	16	9	15	11	26	0	0	0
Feb	7	26	5	5	6	14	6	17	1	35.1	34.5	33.0	34.2	87.5	73.4	78.4	79.8	5.8	6.7	6.0	6.2	3	16	10	16	1	12	0	1	0
Mar	5	23	3	6	4	8	10	29	5	32.4	37.5	34.7	34.9	83.2	73.8	78.3	78.4	7.2	7.7	5.8	6.7	6	10	15	15	3	9	0	1	0
Apr	8	18	4	6	1	12	4	41	1	39.6	46.3	42.6	42.8	83.1	74.8	87.0	81.5	4.7	7.3	4.1	5.4	7	17	6	10	0	0	0	2	0
May	2	17	1	4	6	30	9	22	2	53.9	61.9	55.8	57.2	89.2	80.7	91.5	87.1	4.5	5.5	4.3	4.8	9	17	5	12	0	0	0	6	0
June	7	29	3	5	13	22	3	6	2	60.6	67.7	62.2	63.5	84.9	70.0	85.2	80.0	4.1	4.6	2.2	3.6	17	9	4	8	0	0	4	3	0
July	10	11	2	4	7	19	5	30	5	62.3	66.6	63.7	64.2	87.1	68.0	83.7	78.8	5.8	6.9	3.9	5.5	5	18	8	12	0	0	2	5	0
Aug	14	17	2	11	19	12	4	8	6	72.8	63.8	64.7	63.8	82.9	61.8	83.5	76.1	5.5	6.0	3.5	5.0	9	13	9	11	0	0	2	4	0
Sept	14	4	2	6	43	7	5	6	3	58.4	57.0	59.4	58.3	80.9	48.0	74.7	67.9	3.0	3.8	1.9	2.9	18	9	3	3	0	0	4	0	0
Oct	32	8	3	2	28	3	3	12	2	45.4	45.6	45.8	45.6	78.1	53.2	72.2	67.8	4.1	5.2	3.9	4.4	12	12	7	12	0	1	0	1	0
Nov	25	7	3	2	18	6	9	15	5	31.6	33.0	34.2	32.9	73.5	55.4	74.2	67.7	4.8	5.2	4.2	4.7	12	9	9	8	0	6	0	0	0
Dec	14	15	3	2	6	15	15	19	4	25.3	28.0	27.1	26.8	79.3	68.9	75.9	74.7	5.6	6.6	6.7	6.3	5	13	13	11	6	16	0	0	0
Sums	144	190	35	54	157	172	82	225	39	527.0	565.6	545.6	546.1	981.2	798.9	957.9	912.7	60.0	72.8	52.0	61.6	109	159	98	133	21	70	12	23	0
	Percentages.																					Percentages.								
Means	13.1	17.3	3.2	4.9	14.3	15.7	7.5	20.5	3.6	43.9	47.1	45.5	45.5	81.8	66.6	79.8	76.1	5.0	6.1	4.3	5.1	29.8	43.4	26.8	36.3	5.7	19.1	3.3	6.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.130; February, 0.130; March, 0.130; April, 0.130; May, 0.120; June, 0.120; July, 0.120; August, 0.120; September, 0.120; October, 0.130; November, 0.130; December, 0.130.

REMARKS.—January, frosts, 14th, 21st, and 30th; February, frosts, 3d; lunar halo 3d; March, lunar halo 6th; April, office moved on the 1st; elevation of barometer changed from 92.119 feet to 117 feet; thermometer from 55 feet to 174 feet; rain-gauge, 106 feet to 166.5 feet; anemometer, 110 feet to 175 feet; August, lunar halo, 1st and 12th; frost, 21st and 22d; first snow of the season, 18th November; lunar halo 23d; frost, 3d, 4th and 5th.

CHAS. N. KITCHEL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PIKE'S PEAK, COLO.

Location of office on December 31, 1884, Signal office, summit.

[Latitude, 38° 50′ N.; longitude, 105° 2′ W. Elevation of barometer above sea-level, 14,134 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	17.530	17.544	17.564	17.546	17.906	12	17.287	6	.619	—.4	5.3	2.3	2.4	22.0	12	—33.0	1	55.0	7.8	—4.6	.10	.03	9, 10 29, 30	76	W.	31	NW.	20,816
Feb	17.420	17.427	17.433	17.427	17.832	24	17.021	13	.811	.3	5.0	2.6	2.6	20.0	24	—30.0	18	50.0	8.0	—4.0	.76	.18	17, 18 28	100	W.	15	W.	*21,011
Mar	17.468	17.471	17.488	17.474	17.716	14	17.091	10	.625	2.2	8.0	4.5	4.9	17.0	15	—20.0	11	37.0	10.6	—.8	.39	.15	16	112	SW.	26	W.	19,128
Apr	17.559	17.580	17.592	17.577	17.794	24	17.245	13	.549	4.0	13.0	8.4	8.5	23.0	24 25	—7.0	20	30.0	14.2	2.8	.43	.09	18, 19	80	NW.	1	NW.	16,765
May	17.761	17.778	17.786	17.775	18.059	8	17.391	4	.668	16.7	24.4	20.0	20.4	40.5	28	—3.1	5	43.6	26.8	14.7	2.90	.51	23	70	N.	5	W.	12,522
June	17.955	17.970	17.981	17.969	18.179	29	17.688	11	.491	27.6	33.5	30.2	30.4	43.5	28	19.0	12 15 17	24.5	36.2	25.5	.94	.22	3	92	SW.	12	SW.	18,244
July	18.046	18.070	18.065	18.060	18.157	28	17.882	16	.275	35.2	45.2	38.9	39.8	54.0	26	28.0	30	26.0	47.3	33.5	.41	.21	16	64	W.	16	W.	12,834
Aug	18.031	18.051	18.060	18.047	18.210	4	17.760	19	.450	31.3	40.7	34.8	35.6	48.0	1	23.0	20	25.0	42.1	30.9	.25	.07	8, 9	52	W.	20	W.	9,113
Sept	17.887	17.923	17.914	17.908	18.142	21	17.655	8	.487	27.4	38.0	30.6	32.0	46.7	21	17.5	24	29.2	39.8	26.2	.49	.34	26, 27	64	NW.	28	SW.	16,517
Oct	17.877	17.872	17.888	17.879	18.234	16	17.579	26	.655	21.7	28.7	22.7	24.4	39.5	9	—5.0	27	44.5	30.3	18.8	.99	.35	25, 26	68	W.	5	W., SW.	10,614
Nov	17.747	17.750	17.764	17.754	18.074	6	17.416	22	.658	10.9	16.5	12.6	13.3	29.2	7	—4.4	23	33.6	18.4	8.0	.12	.05	17	83	NW.	23	NE., NW.	10,182
Dec	17.442	17.430	17.452	17.441	17.929	1	17.187	21	.742	3.6	8.1	4.6	5.4	24.5	2	—20.0	31	44.5	10.8	.1	1.50	.37	6, 7	78	W.	15	W.	†10,099
Sums	212.718	212.866	212.987	212.857	....	...	....	...	7.030	180.5	266.4	212.2	219.7	....	....	......	...	442.9	291.8	151.1	9.28	....	......	....	......	....	......	†172,845
Means	17.726	17.739	17.749	17.738	18.234	‡16	17.021	§13	.586	15.0	22.2	17.7	18.3	54.0	‖26	—33.0	¶1	36.9	24.3	12.6	....	....	......	....	......	....	W.	....

* Sum for 28½ days only. † Record incomplete. ‡ October. § February. ‖ July. ¶ January.

PIKE'S PEAK, COLO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	15	12	1	2	3	12	21	27	0	−5.2	−1.5	−3.7	−3.5	80.5	75.2	77.2	77.6	1.6	3.5	1.0	2.2	18	13	0	6	31	31	0	0	0
Feb	13	6	0	1	11	11	23	21	1	−4.4	−.1	−2.0	−2.2	80.7	80.1	81.2	80.7	2.6	6.7	3.7	4.3	10	15	4	14	29	29	0	0	0
Mar	6	11	2	0	8	15	34	17	0	−3.1	1.9	−1.4	−.9	78.5	76.0	76.1	76.9	3.5	5.7	3.7	4.3	12	11	8	8	31	31	0	0	0
Apr	11	8	3	0	2	20	16	26	4	−.7	7.6	3.2	3.4	81.2	78.6	79.0	79.6	3.7	7.1	4.7	5.2	5	17	8	17	30	30	0	0	0
May	11	6	2	4	4	17	28	18	3	12.9	21.7	17.5	17.4	84.9	88.9	90.1	88.0	2.3	5.3	5.0	4.2	11	16	4	22	23	31	0	12	0
June	9	10	8	4	5	26	19	5	4	22.0	27.7	25.2	25.0	78.8	79.1	81.1	79.7	2.0	5.9	4.9	4.3	8	19	3	10	5	26	0	11	0
July	4	5	2	1	10	24	31	16	0	26.3	30.0	28.4	28.2	70.1	56.6	67.3	64.7	3.0	4.2	1.8	3.0	15	15	1	6	0	7	0	8	0
Aug	6	11	10	5	5	14	26	12	4	25.6	30.9	28.0	28.2	79.2	69.3	76.8	75.1	1.9	4.9	3.5	3.4	14	13	4	9	0	19	0	2	0
Sept	4	0	1	1	10	36	30	8	0	20.7	26.5	24.0	23.7	75.5	64.8	76.3	72.0	1.7	3.0	2.6	2.4	17	12	1	4	1	25	0	2	0
Oct	5	1	1	3	8	27	27	14	7	17.0	21.6	17.7	18.8	82.3	75.2	81.6	79.7	.8	5.0	2.8	2.9	17	13	1	9	13	31	0	0	0
Nov	12	19	3	2	3	14	16	19	2	3.1	5.0	4.7	4.3	72.0	61.4	71.3	68.2	2.8	3.4	2.1	2.6	19	8	3	5	30	30	0	0	0
Dec	8	7	1	1	2	23	40	12	4	1.1	4.1	1.5	2.2	89.0	84.1	87.3	86.8	4.8	6.5	3.4	4.9	12	11	8	10	31	31	0	0	0
Sums	99	96	34	24	71	239	311	195	29	115.3	175.4	143.1	144.6	952.7	888.8	945.3	929.0	30.2	61.2	39.8	43.7	158	163	45	120	224	321	0	35	0
	Percentages.																					Percentages.								
Means	9.0	8.7	3.1	2.2	6.5	21.8	28.3	17.8	2.6	9.6	14.6	11.9	12.0	79.4	74.1	78.8	77.4	2.5	5.1	3.3	3.6	43.2	44.5	12.3	32.8	61.2	87.7	0	9.6	0

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.043 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 12.70; February, 12.72; March, 12.59; April, 12.28; May, 12.06; June, 11.82; July, 11.78; August, 11.79; September, 11.98; October, 12.28; November, 12.66; December, 12.66.

REMARKS.—Unusually bright coronæ, with a lunar halo on the 29th of December.

H. HALL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PITTSBURG, PA.

Location of office on December 31, 1884, corner Fifth avenue and Wood street.

[Latitude, 40° 32′ N.; longitude, 80° 2′ W. Elevation of barometer above sea-level, 766 feet. Elevation of exposed thermometer above ground, 88 feet. Elevation of rain-gauge above ground, 86 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.321	29.268	29.284	29.291	29.897	27	28.619	8	1.278	21.8	28.1	24.9	24.9	52.8	31	— 6.0	5	58.8	32.7	15.2	4.82	2.34	8	29	SW.	2	SW.	5,903
Feb	29.211	29.184	29.185	29.193	29.707	15	28.564	19	1.143	36.0	43.3	39.0	39.4	70.0	19	— 3.2	29	73.2	50.8	30.8	4.57	1.11	5, 6	28	W.	20	S.	5,125
Mar......	29.204	29.173	29.185	29.187	29.585	16	28.694	26	.891	35.8	44.8	40.0	40.2	71.3	25	9.5	1	61.8	48.9	32.3	3.71	.69	19	24	W.	12	NW.	5,215
Apr	29.107	29.059	29.088	29.085	29.389	29	28.386	2	1.003	43.7	56.9	48.3	49.6	78.2	27	29.5	6	48.7	59.8	41.0	1.11	.56	1, 2	29	W.	2	NW.	5,276
May	29.162	29.107	29.127	29.132	29.486	3	28.813	19	.673	56.1	71.4	59.7	62.4	91.5	23	39.0	29	52.5	74.8	51.9	3.48	.85	26, 27	24	W., SW.	2, 19	NW.	4,918
June.....	29.277	29.215	29.230	29.241	29.598	15	28.852	10	.746	66.1	81.9	70.0	72.7	95.0	21	50.3	15	44.7	86.3	62.3	1.71	.67	25, 26	24	S. E.	7	NE.	3,326
July	29.114	29.067	29.093	29.091	29.303	21	28.878	29	.425	65.6	80.5	68.8	71.6	97.2	23	52.2	17	45.0	84.7	61.7	4.04	1.41	28, 29	22	W.	23	NW.	4,088
Aug	29.259	29.212	29.239	29.237	29.444	9	28.871	30	.573	64.6	82.0	68.6	71.7	97.9	20	52.5	11	45.4	85.5	62.3	2.94	1.94	16	23	S.	21	NW.	3,444
Sept	29.313	29.242	29.277	29.277	29.628	14	28.968	28	.660	61.6	81.9	67.6	70.4	99.8	10	43.6	21	56.2	85.4	50.4	1.17	.62	28, 29	24	SW.	24	NW.	3,587
Oct	29.354	29.303	29.318	29.325	29.672	25	28.975	8	.697	52.5	66.0	55.7	58.1	91.1	8	29.0	24	62.1	70.4	48.1	2.02	.53	27, 28	21	NW.	8	NW.	4,046
Nov......	29.268	29.221	29.258	29.249	29.581	6	28.704	23	.877	38.6	48.8	40.8	42.7	69.8	4	18.9	24, 25	50.9	53.8	34.0	1.18	.31	18, 19 23, 24	28	W.	23	W.	4,862
Dec......	29.302	29.267	29.296	29.288	29.704	26	28.667	6, 15	1.037	31.4	38.8	32.8	34.3	67.2	5	— 2.0	19	69.2	43.7	26.4	4.07	.97	6, 7	36	W.	9	W.	5,018
Sums ..	350.892	350.318	350.580	350.596	......	...	....	....	10.003	573.8	724.4	616.2	638.0	.....	....	....	.....	668.5	776.8	525.4	34.82	....	......	...	....	...	....	54,808
Means .	29.241	29.193	29.215	29.216	29.897	*27	28.386	†2	.834	47.8	60.4	51.4	53.2	99.8	‡10	— 6.0	*5	55.7	64.7	43.8	.....	....	......	...	....	...	NW.	......

* January. † April. ‡ September.

PITTSBURG, PA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.					
										Washington time.																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																	Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan....	5	7	2	8	16	24	19	17	0	17.7	21.7	20.1	19.8	84.4	77.0	82.1	81.2	6.7	7.1	5.7	6.5	5	12	14	18	13	27	0	0	17 2	2	8 2	24, 26, 28, 29	14 0	5 10.5
Feb...	8	12	8	2	22	8	14	18	0	32.1	35.2	33.7	33.7	85.6	74.5	81.4	80.5	7.4	8.8	7.0	7.6	1	14	14	22	1	14	0	0	33 4	6	6 4	29	27 0	15 5.6
Mar ...	8	17	4	5	10	8	20	26	0	31.0	32.6	32.6	32.1	83.2	64.9	76.0	74.7	8.1	7.4	6.6	7.4	2	11	18	20	4	14	0	3	18 11	13	8 9	7	15 2	10 8.4
Apr....	16	16	5	2	8	4	17	21	1	35.5	36.2	37.8	36.5	73.6	48.6	68.1	63.4	6.0	6.9	5.2	6.0	6	13	11	14	0	2	0	3	12 6	4	8 8	25	8 10	6 2.1
May ...	12	8	4	4	16	11	10	27	1	48.7	48.9	50.7	40.4	76.9	46.9	73.0	65.6	5.4	6.2	4.4	5.8	10	11	10	15	0	0	2	8	7 0	16	2 9	4	4 3	4 9.0
June..	13	19	9	8	8	7	8	18	5	60.1	60.2	62.1	60.8	81.5	50.3	76.3	69.4	4.0	6.5	3.2	4.6	9	15	6	11	0	0	7	7	8 2	12	1 11	8–10	6 8	8 1.9
July ...	10	4	6	2	11	8	14	37	1	58.7	56.5	58.7	58.0	79.8	47.0	71.4	65.9	5.6	6.0	3.6	5.1	6	20	5	11	0	0	6	7	8 4	30	0 4	26	8 0	1 11.2
Aug ...	15	14	4	8	8	10	7	27	5	59.3	56.9	60.9	59.0	83.5	44.8	76.8	68.2	3.3	5.8	2.0	3.7	18	9	4	9	0	0	6	2	5 4	1	0 5	21, 28, 29	4 11	1 5.1
Sept ...	17	8	8	8	11	14	9	20	5	56.2	55.5	58.9	56.9	83.0	41.8	74.5	66.4	2.5	6.0	2.8	3.8	13	14	8	8	0	0	9	3	4 1	19	0 5	11, 12	3 8	2 8.2
Oct ...	12	11	8	5	9	10	18	24	1	47.4	46.9	47.8	47.4	83.4	53.7	75.8	71.0	4.9	5.8	3.1	4.6	11	18	7	10	0	2	2	1	6 7	5	0 8	26	6 4	1 7.3
Nov....	9	13	8	1	18	12	19	14	1	33.1	34.9	33.6	33.9	81.1	60.9	77.0	73.0	6.7	6.3	5.5	6.2	6	12	12	14	0	11	0	0	3 0	1	1 0	20–25	2 0	1 9.4
Dec....	8	18	11	5	18	6	19	14	9	27.4	30.5	27.9	28.6	85.0	73.8	82.8	80.5	7.2	9.1	5.6	7.8	2	18	16	16	6	19	0	0	12 11	23	2 1	5	10 10	5 7.5
Sums.	118	142	62	48	150	122	169	268	29	507.2	516.0	524.8	516.1	980.5	683.7	915.2	859.8	67.8	81.4	54.7	68.1	89	157	120	168	24	89	32	34	......	..	......	.....	111 3	60 9.2
	Percentages.																					Percentages.													
Means.	10.7	12.9	5.6	3.9	13.7	11.1	15.4	24.0	2.6	42.8	43.0	43.7	43.0	81.7	57.0	76.8	71.7	5.6	6.8	4.6	5.7	24.8	42.9	32.8	45.9	6.6	24.8	8.7	9.3	33 4	*6	0 8	†26	9 3.2	5 .8

* February.

† October.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time.

Corrections for instrumental error of barometer used: From 6.48 a. m., January 1, to 2.48 p. m., April 13, inclusive, +.006 inch; from 6.48 p. m., April 13, to 10.48 p. m., April 30, inclusive, +.129 inch; from 2.48 a. m., May 1, to 10.48 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.850; February, 0.860; March, 0.850; April, 0.830; May, 0.800; June, 0.790; July, 0.790; August, 0.790; September, 0.790; October, 0.820; November, 0 850; December, 0.860.

REMARKS.—High water, February 1; flood, February 5 to 6, inclusive, highest water since 1832, 33 feet 4 inches; last snowfall of season, April 9; last heavy frost, April 12; last frost of season, May 30; first frost of season, October 10; first killing frost and ice, October 24; heaviest snowfall of season, 18inches, January 8; first snowfall of season, October 23: parhelion, June 29; polar bands, June 26; shooting stars and meteors, April 7, July 20, 30, August 10, 15, 17, September 11, 14, and October 3; solar halo, May 8, June 20, July 26, and October 17; lunar halo, January 7, 13, March 13, May 11, June 5, July 3, 12, August 4, 30, and December 28; lunar corona, March 10, 12, April 7, 28, May 12, June 6, 8, 9, July 5, 7, 30, August 1, 31, September 3, October 2, 28, and December 5, 27, 29, 30; heavy rains, February 5, 6, 19, 20, March 12, 19, 28, April 1, May 5, July 24, 29, 31, August 16, September 17, and December 15.

O. L. BOZZELL, *Private, Signal Corps, U. S. A.*

Meteorological summary for the year ending December 31, 1884—Continued.

POPLAR RIVER, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 48° 8′ N.; longitude 105° 10′ W. Elevation of barometer above sea-level, 2,080 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.[1]										−5.3	9.3	2.6	2.2	45.0	9	−48.3	4	93.3	12.8	−9.9	.31	.20	29	Gale	NE., NW.	9 11 12 13	W.	
Feb										−11.2	1.7	−4.1	−4.5	41.3	24	−48.3	11	89.6	4.7	−14.9	.41	.27	2, 3	Gale.	NW.	12, 29	W.	
Mar.[2]										20.5	38.6	26.9	28.7	46.5	22	1.6	14	44.9	39.5	18.3	.84	.14	22, 23					
Apr										30.5	47.9	37.4	38.6	73.4	24	9.2	19	64.2	49.7	29.0	.91	.50	29					
May[3]										45.0	68.2	51.9	55.0	83.5	27	24.6	5	58.9	70.0	41.6	.78	.77	11	Gale.	N.	17	W.	
June										59.4	80.2	66.5	68.7	99.1	26	45.0	1	54.1	82.9	54.8	1.67	1.18	6	Gale.	W.	3	S.	
July										53.8	73.9	62.7	64.0	93.0	31	40.2	5	52.8	77.8	52.3	3.40	1.43	3	Gale.	W.	31	E.	
Aug										52.7	79.9	65.5	66.0	99.8	14	48.1	3	56.7	83.1	50.6	.68	.44	1	Gale.	W.	24	W.	
Sept.[4]										41.1	63.1	50.2	51.5	79.3	1	27.6	30	51.7	64.7	34.4	.64	.49	7, 8	Gale.	W.	3	W.	
Oct	27.777	27.812	27.835	27.808	28.217	22	27.427	18	.790	30.5	55.4	42.1	42.7	83.0	18	11.1	23	71.9	59.2	28.9	.46	.20	3	35	W.	25	W.	6,071
Nov	27.926	27.938	27.946	27.937	28.284	16	27.470	26	.814	16.2	36.9	26.2	26.4	58.7	6	−25.2	23	83.9	40.4	18.9	.43	.21	20	40	W.	29	W.	3,328
Dec	27.947	27.969	27.965	27.960	28.399	31	27.414	5	.985	−3.2	3.2	−4.5	−3.2	50.9	1	−49.2	25	100.1	7.1	−11.9	.22	.11	19	32	NW.	10	W.	3,366
Sums										325.5	558.3	423.4	436.1					822.1	591.9	292.1	10.25							
Means										27.2	46.5	35.3	36.3	99.8	[5]14	−49.2	[6]25	68.5	49.3	24.3								

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[1] Observations for 28 days.
[2] Observations for 19 days.
[3] Observations for 29 days.
[4] Observations for 25 days.
[5] August.
[6] December.

POPLAR RIVER, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	3	8	7	5	0	8	33	0	4	− 8.0	7.4	− 0.6	− 0.4	89.0	91.1	87.2	89.1	5.4	6.8	4.3	5.5	4	14	5	4	18	23	0	0	1
Feb	5	7	28	0	1	8	30	5	3	−13.6	− 0.3	− 6.4	− 6.8	89.6	91.7	90.1	90.5	5.9	6.4	5.2	5.8	7	9	13	5	25	29	0	0	0
Mar	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	4.5	4.1	3.5	4.0	11	2	6	5	2	19	0	0	0
Apr	......	......	......	......	......	......	......	......	......	26.5	41.0	33.7	33.7	85.7	79.5	87.1	84.1	6.0	5.3	4.3	5.2	12	7	11	9	0	21	0	0	1
May	8	2	13	5	19	2	30	2	6	37.7	45.8	42.9	42.1	75.8	47.4	72.7	65.8	4.7	4.9	1.0	3.5	15	11	3	2	0	8	0	0	0
June	7	6	20	5	28	2	15	2	5	51.3	55.1	55.1	53.8	75.1	45.0	68.7	62.9	3.1	2.9	3.7	3.2	16	10	4	7	0	0	6	1	0
July	19	4	25	9	5	2	22	5	2	49.3	57.9	56.9	54.7	81.0	58.9	82.7	74.2	6.4	5.4	4.5	5.4	6	18	7	11	0	0	1	2	0
Aug	17	6	12	11	8	10	23	6	0	46.4	61.4	56.6	54.8	79.9	54.8	74.3	69.7	4.2	3.6	2.2	3.3	19	8	4	6	0	0	9	0	0
Sept	6	4	13	5	1	1	37	6	2	37.5	51.1	45.3	44.6	87.6	67.1	84.7	79.8	5.4	6.7	3.6	5.2	4	16	5	5	0	2	0	0	3
Oct	15	2	6	10	9	6	30	9	0	27.0	42.6	35.9	35.2	87.0	64.9	80.2	77.4	4.7	5.8	3.3	4.6	13	10	8	6	1	17	0	0	0
Nov	17	1	12	0	2	5	40	5	8	14.7	32.8	25.0	24.2	93.6	85.8	95.3	91.6	4.6	4.8	3.2	4.2	12	11	7	5	7	30	0	0	1
Dec	18	8	9	1	0	0	41	10	11	− 8.6	1.6	− 4.8	− 3.9	98.5	94.2	98.8	97.2	5.6	5.6	3.9	5.0	9	14	8	6	24	31	0	0	0
Sums	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	60.5	61.8	43.2	54.9	128	130	81	71	77	175	16	8	6
	Percentages.																					Percentages.								
Means	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	5.0	5.2	3.6	4.6	37.8	38.3	23.9	20.9	22.7	51.6	4.7	0.9	1.8

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., October 1, to 11 p. m., December 31, 1884, inclusive, + .010 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: October, 2.22; November, 2.29; December, 2.36.

GEO. A. CARDEN,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PORT HURON, MICH.

Location of office on December 31, 1884, City Hall building, corner Broad and Huron avenues.

[Latitude, 43° N.; longitude, 82° 26′ W. Elevation of barometer above sea-level, 633 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 63 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only). Washington time. 7 a. m.	Barometer: Washington time. 3 p. m.	Barometer: Washington time. 11 p. m.	Barometer: Monthly mean.	Barometer: Highest.	Barometer: Date.	Barometer: Lowest.	Barometer: Date.	Barometer: Range.	Temperature. Washington time. 7 a. m.	Temperature: Washington time. 3 p. m.	Temperature: Washington time. 11 p. m.	Temperature: Monthly mean.	Temperature: Self-registering thermometers. Maximum.	Self-registering: Date.	Self-registering: Minimum.	Self-registering: Date.	Self-registering: Absolute range.	Temperature: Mean maximum.	Temperature: Mean minimum.	Precipitation. Total amount.	Precipitation: Any 3 consecutive 8-hourly measurements. Largest amount.	Precipitation: Date.	Wind. Maximum hourly velocity during month. Miles.	Wind: Direction from—	Wind: Date.	Wind: Prevailing direction.	Wind: Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.376	29.344	29.388	29.369	30.017	27	28.620	2	1.397	12.7	19.1	15.1	15.6	47.8	30	—11.3	25	59.1	23.7	7.6	1.63	.55	30	36	SW.	8	SW.	9,301
Feb	29.316	29.300	29.308	29.308	29.858	10	28.458	19	1.400	21.2	25.8	23.5	23.5	56.9	19	—15.3	29	72.2	32.0	16.4	3.16	.96	12, 13	39	W.	20	NE.	6,577
Mar	29.325	29.319	29.318	29.321	29.711	30	28.642	26	1.069	25.0	33.2	28.5	28.9	59.8	23	— 5.9	2	65.7	36.5	22.0	1.84	.64	25, 26	50	W.	12	NE.	7,660
Apr	29.268	29.241	29.257	29.254	29.758	21	28.533	15	1.225	36.3	43.6	37.6	39.2	69.0	27	26.5	7	42.5	47.0	33.3	2.58	1.05	15	39	N.	2, 20	N., NE.	7,867
May	29.250	29.282	29.246	29.243	29.618	29	28.839	19	.779	49.7	59.3	50.8	53.3	80.4	23	32.0	29	48.4	63.3	45.4	1.71	.47	1, 2	40	SW.	2	NE.	7,358
June	29.412	29.388	29.388	29.396	29.712	15	29.066	9	.646	62.6	70.8	62.7	65.4	87.0	28	46.5	11	40.5	76.0	57.0	2.87	1.13	23	33	NW.	23	NE.	4,812
July	29.230	29.208	29.227	29.222	29.440	8	28.944	31	.496	60.5	71.1	62.5	64.7	87.1	1	46.5	17	40.6	74.3	56.8	2.04	.82	4	34	W.	5	NE.	5,585
Aug	29.365	29.331	29.344	29.347	29.682	9	28.959	28	.723	61.4	72.3	63.7	65.8	91.8	17	47.0	8	44.8	76.1	57.5	1.28	.91	28, 29	25	SW.	8	NE.	5,634
Sept	29.381	29.344	29.367	29.364	29.802	13	28.914	28	.888	60.2	71.6	62.9	64.9	91.6	10	39.0	19	52.6	75.2	56.9	1.87	.55	27	37	W.	24	S.	5,823
Oct	29.443	29.409	29.412	29.421	29.859	14	29.072	8	.787	47.1	56.2	49.8	51.0	84.0	3	23.8	24	60.2	60.9	43.8	4.86	1.59	1, 2	32	NW.	8	S.	6,367
Nov	29.346	29.320	29.361	29.342	29.675	3	28.622	23	1.053	32.0	38.7	33.3	34.7	57.0	9, 10	10.6	25	46.4	42.5	27.9	2.84	1.17	4	37	W.	23	S.	6,681
Dec	29.375	29.365	29.399	29.380	29.958	26	28.696	7	1.262	23.0	28.9	25.8	25.9	56.2	31	—10.8	19	67.0	32.9	19.4	3.01	.97	24	48	W.	31	S.	8,176
Sums	352.082	351.807	352.010	351.967	....	..	....	...	11.725	491.7	590.6	516.2	532.9	....	....	.....	...	640.0	640.4	448.5	29.69	....	......	...	....	....	....	82,441
Means	29.340	29.317	29.334	29.331	30.017	*27	28.458	†19	.977	41.0	49.2	43.0	44.4	91.8	‡17	—15.3	§29	53.3	53.4	37.0	.....	....	......	...	....	....	S.	......

* January. † February. ‡ August. § February.

PORT HURON, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of time observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
										Washington time.																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	9	2	4	17	26	15	10	1	8.6	12.4	10.4	10.5	83.6	74.9	81.0	79.8	7.0	7.0	7.7	7.2	3	12	16	16	24	30	0	0	0
Feb	8	18	5	5	16	7	16	8	4	17.5	19.5	19.7	18.9	85.4	77.2	84.8	82.5	8.4	8.1	6.4	7.6	3	9	17	21	14	26	0	0	0
Mar	17	23	3	6	17	10	6	9	2	21.3	24.9	23.6	23.3	86.0	71.8	81.4	79.7	5.7	5.2	5.4	5.4	8	13	10	14	10	24	0	2	0
Apr	24	24	5	5	8	5	7	9	3	31.2	31.5	31.1	31.3	82.2	64.9	78.7	75.3	5.0	5.0	4.4	4.8	12	10	8	11	0	13	0	2	1
May	7	28	1	9	19	13	8	7	1	44.4	43.0	43.4	43.6	82.9	58.9	77.3	73.0	5.7	6.4	3.4	5.2	10	13	8	12	0	0	0	2	0
June	17	24	5	2	20	9	1	1	11	56.0	54.8	55.8	55.5	80.2	60.6	79.4	73.4	3.2	4.8	2.3	3.4	13	15	2	7	0	0	0	5	0
July	12	26	2	4	9	14	10	8	8	55.6	55.3	56.1	55.7	84.6	59.6	80.7	75.0	3.9	6.0	2.8	4.2	12	17	2	10	0	0	0	2	0
Aug	6	21	2	10	18	12	9	8	7	56.4	55.3	56.4	56.0	84.3	57.5	77.9	73.2	3.7	4.8	2.2	3.6	17	11	3	8	0	0	2	2	0
Sept	2	13	5	7	29	13	6	7	8	56.0	55.3	55.4	55.6	87.0	59.8	77.6	74.8	4.7	4.1	2.7	3.8	13	13	4	9	0	0	2	1	0
Oct	6	11	2	9	25	17	10	8	5	42.4	43.9	43.8	43.4	84.2	67.2	80.5	77.3	4.9	6.9	4.4	5.4	9	15	7	13	0	3	0	2	0
Nov	2	4	4	0	20	18	15	18	9	28.6	31.1	29.5	29.7	87.8	75.9	86.0	83.2	6.3	7.4	4.4	6.0	8	12	10	8	8	18	0	0	0
Dec	1	6	8	3	29	19	18	8	1	19.4	25.0	22.9	22.4	86.3	85.3	89.4	87.0	6.5	7.8	7.1	7.1	4	12	15	19	11	25	0	0	0
Sums	111	207	44	64	227	163	121	101	60	437.4	452.0	448.1	445.9	1,014.5	813.6	974.7	934.2	65.0	73.5	53.2	63.7	112	152	102	148	67	139	4	18	1
	Percentages.																					Percentages.								
Means	10.1	18.9	4.0	5.8	20.7	14.8	11.0	9.2	5.5	36.4	37.7	37.3	37.1	84.5	67.8	81.2	77.8	5.4	6.1	4.4	5.3	30.6	41.5	27.9	40.4	18.3	38.0	1.1	4.9	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time.

Correction for instrumental error of barometer used: From 6.38 a. m., January 1, to 10.38 p. m., December 31, 1884, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.730; February, 0.730; March, 0.730; April, 0.700; May, 0.680; June, 0.670; July, 0.660; August, 0.660; September, 0.670; October, 0.690; November, 0.720; December 0.730.

REMARKS.—Aurora April 24 from 10.50 p. m. to to 11.45 p. m.; hail-storm April 27; during August and September very dry; destructive forest fires September 15, 16, and 17; first frost August 24; last frost May 3.

M. H. PERRY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PORTLAND, ME.

Location of office on December 31, 1884, United States custom-house, corner Fore and Pearl streets.

[Latitude, 43° 39′ N.; longitude, 70° 15′ W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.029	30.001	29.990	30.007	30.739	27	29.148	9	1.591	18.2	26.7	22.8	22.4	48.0	9	−3.0	7	51.0	29.5	13.3	4.54	1.19	2	56	SE.	9	SW.	6,806
Feb	30.038	29.954	30.014	30.002	30.747	16	28.824	28	1.923	27.2	33.1	28.7	29.7	49.0	14	7.7	29	41.3	37.1	21.6	6.92	1.98	28, 29	39	S.	20	NE.	5,880
Mar	29.942	29.894	29.922	29.919	30.383	11	29.400	27	.983	29.4	39.0	32.8	33.7	58.7	25	2.9	5	55.8	41.2	25.7	4.86	1.37	26, 27	28	N.	30	N.	6,468
Apr	29.751	29.728	29.754	29.744	30.130	27	28.844	3	1.286	42.3	51.1	43.6	45.7	68.0	30	29.3	1	38.7	52.5	38.8	6.12	3.32	15, 16	31	N.	3	NE.	6,284
May	29.883	29.838	29.872	29.864	30.265	31	29.364	11	.901	50.9	59.0	51.8	53.9	82.7	24	39.2	31	43.5	61.7	45.9	6.46	1.95	20, 21	28	NW.	12	W.	5,736
June	30.034	29.977	29.985	29.999	30.493	14	29.597	24	.896	63.2	73.5	63.7	66.8	89.4	21	44.3	2	45.1	76.1	57.3	1.41	.63	6	24	NE.	10	S.	4,951
July	29.755	29.724	29.742	29.740	30.031	4	29.431	14	.600	64.7	73.6	64.3	67.5	86.7	8	55.0	21	31.7	76.1	60.2	6.78	3.46	9, 10	24	SW.	6	S.	5,454
Aug	30.001	29.964	29.979	29.981	30.249	9	29.661	31	.588	64.6	72.6	65.4	67.5	88.0	18	52.7	28	35.3	75.7	61.1	3.98	1.14	22	32	S.	29	S.	5,103
Sept	30.026	29.967	29.999	29.997	30.410	14	29.574	16	.836	59.8	70.4	61.8	64.0	88.4	6	40.5	14	47.9	72.2	55.7	.56	.18	24	28	N.	28	S.	5,087
Oct	30.047	29.979	30.017	30.014	30.515	26	29.549	17	.966	47.4	55.6	48.7	50.6	79.2	1	34.6	26	44.6	58.4	43.1	2.21	.53	12	33	N.	9	NW.	6,256
Nov	29.960	29.935	29.938	29.944	30.441	19	29.245	29	1.196	35.5	43.3	38.4	39.1	58.8	11	22.8	19	36.0	46.7	32.7	2.25	.72	24	40	S.	24	W.	6,238
Dec	30.059	30.030	30.025	30.038	30.749	27	29.294	7	1.455	28.4	33.5	30.2	30.7	59.0	7	−6.1	20	65.1	38.3	24.5	6.42	2.30	15	35	SE.	7	N.	6,426
Sums	359.525	358.991	359.237	359.249	....	...	....	...	13.221	531.6	631.4	551.7	571.6	....	....	....	..	536.0	665.5	479.9	52.51	....	......	...	....	....	....	70,689
Means	29.960	29.916	29.936	29.937	30.749	*27	28.824	†28	1.102	44.3	52.6	46.0	47.6	89.4	‡21	−6.1	*20	44.7	55.5	40.0	.....	....	......	..	....	....	SW.	......

* December.

† February.

‡ June.

PORTLAND, ME.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	20	13	2	0	5	31	8	13	1	12.5	18.0	15.4	15.3	77.9	70.2	74.8	74.3	5.5	5.8	4.2	5.2	9	14	8	15	17	30	0	0	0
Feb	19	20	1	5	8	13	3	15	3	21.6	25.1	22.2	23.0	78.7	72.6	75.9	75.7	6.7	8.4	5.2	6.8	1	16	12	20	6	26	0	0	1
Mar	20	13	5	3	5	15	4	19	9	21.4	25.3	24.1	23.6	71.9	59.6	70.6	67.4	6.0	6.7	4.8	5.8	7	14	10	19	7	18	0	0	2
Apr	19	22	4	8	5	2	6	18	6	34.9	30.7	35.2	33.6	75.6	60.6	73.0	69.7	5.5	6.9	6.7	6.4	7	9	14	16	0	4	0	1	2
May	9	10	11	10	15	10	20	7	1	40.4	42.6	41.1	41.4	68.6	58.5	68.3	65.1	6.5	7.8	5.5	6.6	3	16	12	14	0	0	0	1	0
June	10	9	8	4	18	17	12	10	2	53.0	55.0	54.3	54.1	70.4	55.3	72.4	66.0	4.4	4.5	3.1	4.0	12	12	6	7	0	0	0	5	1
July	9	6	6	7	23	16	19	7	0	57.4	58.5	56.8	57.6	77.7	60.6	77.3	71.9	3.5	6.0	4.9	4.8	7	19	5	15	0	0	0	2	2
Aug	9	5	2	9	36	10	10	10	2	59.3	61.2	59.7	60.1	83.6	69.0	82.4	78.3	4.7	5.6	4.3	4.9	9	16	6	12	0	0	0	2	0
Sept	9	3	5	6	24	13	17	13	0	53.0	56.6	44.4	54.7	78.8	63.7	77.4	73.3	4.8	4.5	3.7	4.2	12	12	6	11	0	0	0	1	3
Oct	15	9	2	4	10	19	11	22	1	39.8	41.2	39.7	40.2	75.4	60.5	72.5	69.5	4.9	6.7	5.8	5.8	8	12	11	15	0	0	0	1	1
Nov	13	5	3	2	7	22	25	10	3	29.2	30.7	30.8	30.2	77.8	62.4	74.8	71.7	5.1	4.5	5.0	4.9	9	13	8	9	1	12	0	0	1
Dec	24	6	7	2	5	22	16	11	0	22.4	25.4	24.8	24.2	78.1	72.8	80.8	77.2	6.0	5.6	5.9	5.8	4	18	9	9	7	20	0	0	0
Sums	176	121	56	60	161	190	151	155	28	444.9	476.3	458.5	460.0	914.5	765.8	900.2	860.1	63.1	73.0	59.1	65.2	88	171	107	162	38	110	0	13	13
	Percentages.																					Percentages.								
Means	16.0	11.0	5.1	5.5	14.7	17.3	13.8	14.1	2.5	37.1	39.7	38.2	38.3	76.2	63.8	75.0	71.7	5.3	6.1	4.9	5.4	24.0	46.7	29.2	44.3	10.4	30.1	0	3.6	3.6

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.27 a. m., 3.27 p. m., and 11.27 p. m., local time.
Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., December 31, 1884, inclusive, +.001 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

G. LIEBMANN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PORTLAND, OREG.

Location of office on December 31, 1884, No. 48 First street.

[Latitude, 45° 32′ N.; longitude, 122° 43′ W. Elevation of barometer above sea-level, 67 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.063	30.069	30.057	30.063	30.482	23	29.363	26	1.119	36.4	41.2	38.5	38.7	59.2	4	25.0	1	34.2	46.2	33.8	3.70	.90	7, 8	23	ES.	7	S.	3,662
Feb	29.969	29.969	29.963	29.967	30.462	12	29.262	17	1.200	32.2	38.9	36.9	36.0	64.7	28	7.2	12	57.5	44.4	29.4	4.88	1.70	19	24	NE.	6, 10	S.	4,141
Mar	29.856	29.860	29.847	29.854	30.245	20	29.304	9	.941	40.0	49.8	46.4	45.4	66.7	31	28.2	8	38.5	55.6	37.8	2.25	.75	9	19	ES.	6, 22	S.	3,379
Apr	29.867	29.859	29.857	29.861	30.202	3	29.468	10	.737	47.5	60.4	54.2	54.0	79.6	7	39.6	4	40.0	65.1	45.3	3.57	.81	18	22	S.	3	S.	3,790
May	29.953	29.933	29.901	29.929	30.195	28	29.574	19	.621	50.8	65.8	62.7	59.8	90.0	31	40.4	28	49.6	73.6	48.7	1.34	.84	25, 26	20	W.	4	NW.	3,859
June	29.890	29.884	29.857	29.877	30.087	24	29.550	21	.537	55.5	67.9	64.8	62.7	89.0	1	47.0	7	42.0	74.9	53.7	1.42	.50	24	20	S.	2	S.	3,684
July	29.971	29.976	29.938	29.962	30.113	8	29.640	13	.470	56.9	68.0	65.6	63.5	84.3	13	48.5	4	35.8	75.0	55.9	1.80	.74	17, 18	18	S.	25	N.	3,282
Aug	29.928	29.924	29.886	29.913	30.144	28	29.702	2	.442	58.4	74.6	70.9	68.0	94.2	2	51.2	28	43.0	81.9	57.7	.83	.23	26	16	NE.	2	N.	3,258
Sept	29.935	29.934	29.927	29.932	30.192	26	29.625	7	.567	50.5	61.3	55.3	55.7	72.4	1	43.0	26	29.4	66.5	49.4	4.25	.83	10, 11	19	S.	8	S.	3,161
Oct	29.979	29.984	29.972	29.978	30.349	26	29.383	12	.960	46.6	56.2	50.9	51.2	72.0	16	36.0	26	36.0	61.9	44.9	4.01	1.48	11	22	S.	11	S.	3,211
Nov	30.024	30.027	30.016	30.022	30.306	26	29.762	9	.544	43.8	50.2	46.2	46.7	63.2	9	34.0	27	29.2	55.1	41.4	3.24	1.23	3	15	E.	12	S.	2,063
Dec	29.900	29.923	29.905	29.909	30.381	7	29.111	19	1.270	29.1	33.1	30.9	31.0	54.8	3	12.0	24	42.8	37.5	25.5	7.52	1.59	18, 19	24	E.	16	E.	3,437
Sums..	359.335	359.342	359.126	359.267	....	..	....	...	9.419	547.7	667.4	623.8	612.7	......	...	.....	...	478.0	737.7	523.0	38.81	....	......	...	....	....	....	40,946
Means.	29.945	29.945	29.927	29.939	30.482	*23	29.111	†19	.785	45.6	55.6	51.9	51.0	94.2	‡2	7.2	§12	39.8	61.5	43.6	.....	....	......	...	....	....	S.	......

* January. † December. ‡ August. § February.

PORTLAND, OREG.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point. (Washington time.)				Relative humidity (per cent.). (Washington time.)				Cloudiness (in tenths). (Washington time.)				Number of days—								River.									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	*Ft.*	*In.*		*Ft.*	*In.*		*Ft.*	*In.*	*Ft.*	*In.*
Jan	10	6	15	7	21	5	2	7	20	32.0	31.4	32.0	31.8	84.5	69.5	78.3	77.4	4.9	6.1	5.5	5.5	9	10	12	13	0	13	0	0	8	10	10	0	8	24	8	2	4	8
Feb	7	18	12	1	23	3	2	12	9	28.1	32.1	31.1	30.4	84.7	77.1	80.4	80.7	5.3	5.6	5.0	5.3	10	7	12	16	4	16	0	0	12	0	25	1	5	12, 13	10	7	4	10
Mar	6	7	9	1	24	11	9	13	13	35.5	37.1	38.4	37.0	84.8	63.8	74.8	74.1	6.7	6.8	5.0	9.2	5	13	13	15	0	1	0	0	7	1	1	3	5	21	3	8	4	8
Apr	9	8	2	1	27	9	10	11	18	42.3	42.1	43.8	42.7	82.8	53.1	70.8	68.7	6.6	6.8	5.9	6.4	7	7	16	17	0	0	0	0	11	5	28	3	7	4	7	10	7	4
May	11	2	0	2	20	6	10	29	13	45.3	45.6	47.7	46.2	81.6	49.8	60.4	63.9	4.8	4.9	3.9	4.5	11	11	9	11	0	0	0	0	18	5	31	8	11	4	9	6	13	1
June	26	0	0	2	30	4	8	11	14	49.6	49.6	53.4	50.9	80.9	53.1	67.9	67.3	7.7	6.4	6.6	6.9	4	8	18	16	0	0	0	1	20	2	14, 15	17	11	2, 3	2	3	19	2
July	31	0	2	0	22	4	6	11	17	52.4	51.6	53.5	52.5	85.0	56.9	66.5	69.5	6.9	6.1	4.9	6.0	7	11	13	10	0	0	0	2	17	7	1	7	8	31	9	11	11	11
Aug	34	2	1	2	8	3	8	24	16	53.7	53.2	54.9	53.9	84.7	48.4	58.5	63.9	1.9	3.4	2.7	2.7	19	8	4	8	0	0	3	0	7	8	7	3	8	31	4	0	6	6
Sept	8	1	0	3	26	6	21	3	22	47.4	48.8	49.7	48.6	89.7	64.6	81.7	78.7	6.6	7.7	4.5	6.3	5	16	9	12	0	0	0	0	5	5	11	0	6	30	4	11	3	10
Oct	7	0	1	3	28	15	6	10	23	44.4	45.7	46.6	45.6	92.1	69.3	86.6	82.5	6.2	7.8	4.5	6.0	8	11	12	17	0	0	0	0	5	0	13	0	11	1	4	1	3	3
Nov	5	2	11	4	16	10	12	5	25	41.1	42.8	42.1	42.0	90.8	77.1	86.4	84.8	5.5	5.6	4.8	5.1	10	10	10	15	0	0	0	0	5	4	6, 7	1	6	29	3	10	3	6
Dec	7	2	31	5	14	10	8	4	17	24.7	25.2	25.0	25.0	83.5	73.0	79.0	78.5	6.6	7.6	6.4	6.9	5	11	15	21	9	28	0	0	9	0	22	1	2	13–15	7	10	3	11
Sums ..	161	43	84	31	259	86	87	140	207	496.5	505.2	518.2	506.6	1024.6	755.2	890.8	890.0	69.7	74.3	59.2	67.8	100	123	143	166	13	58	3	3	......		......	......		......	76	7	86	8
	Percentages.																					Percentages.																	
Means .	14.7	3.9	7.7	2.8	23.6	7.8	7.9	12.8	18.9	41.4	42.1	43.2	42.2	85.4	62.9	74.2	74.2	5.8	6.2	4.9	5.6	27.3	33.6	39.1	45.4	3.6	14.5	.8	.8	20	2	*14, 15	0	6	†20	6	4.6	7	2.7

*June. †September.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 3.57 a. m., 11.57 a. m., and 7.57 p. m., local time.

Correction for instrumental error of barometer used: From 3.57 a. m., January 1, to 7.57 p. m., December 31, 1884, inclusive —.028 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 5.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

M. L. HEARNE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PRESCOTT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 34° 33′ N.; longitude, 112° 28′ W. Elevation of barometer above sea-level, 5,389 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 3 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	24.783	24.777	24.792	24.784	25.067	1	24.518	25	.554	28.6	46.8	35.6	37.0	62.0	12	18.0	2	49.0	50.5	25.8	.25	.15	16	40	NE.	10	SW.	4,269
Feb	24.677	24.678	24.689	24.681	24.996	22	24.096	6	.900	31.5	46.1	38.0	38.5	67.2	25	10.0	18	57.2	49.8	28.9	6.55	1.68	3	46	SW.	6	SW.	5,584
Mar	24.613	24.641	24.639	24.631	24.880	13	24.320	23	.560	33.6	48.0	40.9	40.8	63.0	14	20.0	21	43.0	52.1	31.9	5.51	1.10	3, 4	45	SW.	10	SW.	6,258
Apr	24.634	24.659	24.647	24.647	24.815	1	24.282	19, 28	.533	35.7	54.9	45.7	45.4	71.2	24	18.3	1	52.9	58.4	34.4	1.62	.45	16	44	S.	12	S.	6,275
May	24.705	24.715	24.712	24.711	24.895	9	24.541	18, 20	.354	43.0	66.3	54.9	54.7	82.5	8	30.2	2	52.3	69.6	42.1	1.45	.74	1	30	E.	18	S.	5,082
June	24.726	24.746	24.733	24.735	24.894	28	24.593	5	.301	48.2	77.3	62.9	62.8	92.5	30	37.0	14	55.5	80.3	47.6	.32	.22	6	31	S.	13	S.	5,028
July	24.799	24.815	24.794	24.803	24.889	8	24.700	5, 13	.189	57.8	85.7	72.2	71.9	96.0	5	46.8	17	49.2	88.5	57.4	1.33	.71	7, 8	41	S.	15	S.	4,615
Aug	24.798	24.807	24.798	24.801	24.946	4	24.538	18	.408	56.8	79.7	67.7	68.1	91.5	1	41.2	19	50.3	83.8	55.8	1.57	.55	30	34	S.	18	S.	3,803
Sept	24.736	24.750	24.739	24.742	24.906	15	24.463	30	.443	48.6	73.3	59.6	60.5	87.0	20	32.8	15	54.7	76.3	46.9	.99	.64	2	34	SW.	7	S.	4,774
Oct	24.745	24.748	24.760	24.751	25.011	16	24.320	1	.691	43.5	65.8	51.2	53.5	79.0	8	29.6	28	49.4	68.7	41.5	1.42	.61	23	37	S.	1	S.	4,174
Nov	24.792	24.785	24.805	24.794	24.964	6	24.438	21	.526	31.1	59.1	40.1	43.4	69.0	1, 4, 5	15.6	19	53.4	62.0	28.7	.16	.16	21	23	S.	8	SW.	2,137
Dec	24.614	24.615	24.634	24.621	24.975	1	24.259	27	.716	26.8	42.9	31.0	33.6	64.0	2, 3	−4.5	31	68.5	45.0	22.7	5.58	1.89	12, 13	34	SE.	7	SW.	4,920
Sums ..	296.622	296.736	296.742	296.701	....	...	....	.....	6.175	485.2	745.9	599.8	610.2	......	......	...	..	635.4	784.5	463.2	26.75	......	......	....	....	...	......	56,954
Means.	24.718	24.728	24.728	24.725	25.067	*1	24.096	†6	.515	40.4	62.2	50.0	50.9	96.0	‡5	−4.5	§31	53.0	65.4	38.6	.....	......	......	....	....	...	S.	......

*January. †February. ‡July. §December.

PRESCOTT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	4	11	17	7	10	33	7	0	4	20.8	22.5	24.0	22.4	73.2	39.8	62.9	58.6	2.6	4.8	2.5	3.3	14	15	2	2	0	24	0	0	0
Feb	7	7	3	1	23	34	6	1	5	26.8	30.1	29.2	28.7	82.5	56.9	70.9	70.1	3.8	5.3	3.5	4.2	13	9	7	12	1	20	0	0	0
Mar	2	7	4	5	30	35	5	1	4	29.2	32.9	31.8	31.3	84.3	59.4	72.0	71.9	4.7	6.1	4.4	5.1	9	12	10	14	0	20	0	0	0
Apr	7	3	0	3	48	11	2	1	15	30.8	32.7	32.7	32.1	83.5	46.6	62.7	64.3	3.2	5.0	2.2	3.5	15	12	3	9	0	9	0	2	0
May	2	4	3	11	30	20	0	3	20	35.4	38.2	37.5	37.0	76.5	39.3	54.6	56.8	2.3	3.4	1.6	2.4	17	12	2	6	0	1	0	2	0
June	0	2	3	9	38	8	0	0	30	37.0	45.2	40.8	41.0	66.2	33.0	45.7	48.3	1.5	3.0	1.3	1.9	21	8	1	2	0	0	2	2	0
July	0	2	0	7	24	19	2	0	39	48.3	56.5	52.1	52.3	71.5	38.4	51.1	53.7	1.4	2.5	1.5	1.8	22	9	0	4	0	0	12	7	0
Aug	4	11	4	9	25	11	7	1	21	46.5	45.2	48.5	46.7	69.5	32.0	52.1	51.2	2.4	4.8	2.8	3.3	13	15	3	12	0	0	4	15	0
Sept	4	2	1	5	41	12	1	2	22	38.6	41.8	42.0	40.8	69.3	35.6	53.8	52.9	1.3	2.6	1.2	1.7	22	7	1	5	0	0	0	5	0
Oct	3	8	10	12	27	9	2	2	20	35.2	33.8	38.8	35.9	73.7	33.4	63.9	57.0	1.1	4.3	1.5	2.3	19	11	1	4	0	4	0	4	0
Nov	12	8	4	4	13	14	7	5	23	24.7	21.6	27.9	24.7	76.7	24.7	61.6	54.3	.6	2.1	1.3	1.3	23	7	0	1	0	21	0	1	0
Dec	10	4	4	6	20	29	3	2	15	21.6	24.1	22.4	22.7	81.6	54.3	73.1	69.7	3.5	4.6	4.0	4.0	14	9	8	12	3	22	0	2	0
Sums ..	55	69	53	79	329	235	42	18	218	394.9	424.6	427.7	415.6	908.5	493.4	724.4	708.8	28.4	48.5	27.8	34.8	202	126	38	83	4	121	18	40	0
	Percentages.																					Percentages.								
Means .	5.0	6.3	4.8	7.2	30.0	21.4	3.8	1.6	19.9	32.9	35.4	35.6	34.6	75.7	41.1	60.4	59.1	2.4	4.0	2.3	2.9	55.2	34.4	10.4	22.7	1.1	33.1	4.9	10.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.38 a. m., 12.38 p. m., and 8.38 p. m., local time.

Correction for instrumental error of barometer used: From 4.38 a. m., January 1, to 8.38 p. m., December 31, 1884, inclusive, —.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.43; February, 5.41; March, 5.39; April, 5.27; May, 5.14; June 5.06; July, 5.03; August, 5.02; September, 5.14; October, 5.20; November, 5.39; December, 5.42.

REMARKS.—Office moved March 18, 1884, and elevation of barometer cistern increased 49 feet. Thermometers changed March 18 from an elevation of 10 feet to 6.8 feet; rain-gauge from 3 feet to 3.2 feet.

JNO. GROVER,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PROVINCETOWN, MASS.

Location of office on March 31, 1884, Center street, between Commercial and Bradford streets.

[Latitude, 42° 3′ N.; longitude, 70° 11′ W. Elevation of barometer above sea-level, 26 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.079	30.085	30.033	30.049	30.765	27	29.123	2	1.642	26.7	30.4	28.5	28.5	48.4	9	9.4	6	39.0	34.8	22.7	6.58	2.77	9	53	SE.	9	SW., W., NW.	8,919
Feb.*	30.040	29.975	30.047	30.024	30.759	16	28.739	28	2.020	33.2	36.3	32.7	34.1	48.8	14	0.3	29	48.5	40.8	27.5	7.34	1.73	23	49	SE.	20	NW.	7,749
Mar	29.961	29.927	29.942	29.943	30.400	11	29.879	29	1.021	32.2	37.5	34.0	34.6	57.0	24	6.4	1	50.6	41.1	28.7	6.77	2.18	26, 27	43	SE.	26	NW.	8,443
Apr	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
May	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
June	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
July	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Aug	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Sept	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Oct	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Nov	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Dec	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Sums	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......
Means	......	......	......	......	......	...	......	...	......	......	......	......	......	......	...	......	...	......	......	......	......	......	......	......	......	...	......	......

* One 11 p. m. observation missed.

PROVINCETOWN, MASS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	15	5	5	7	7	17	17	17	3	21.5	22.6	22.7	22.3	80.2	73.4	78.6	77.4	6.5	6.6	7.2	6.8	5	11	15	16	12	26	0	0	0
Feb	4	12	7	16	7	14	7	17	2	29.6	32.0	28.8	30.1	86.9	85.2	85.5	85.9	7.9	7.2	6.6	7.2	2	13	18	17	1	21	0	0	0
Mar	8	10	5	9	10	12	12	27	0	27.6	29.5	29.2	28.8	83.4	78.5	88.0	80.0	7.1	7.5	5.4	6.7	4	13	14	21	5	18	0	0	0
Apr																														
May																														
June																														
July																														
Aug																														
Sept																														
Oct																														
Nov																														
Dec																														
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.27 a. m., 3.27 p. m., and 11.27 p. m., local time.
Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., March 31, 1884, inclusive, — .001 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.080; February, 0.080; March, 0.080.
Station closed April 1.

O. N. KITCHEL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

RED BLUFF, CAL.

Location of office on December 31, 1884, corner Main and Pine streets.

[Latitude, 40° 10′ N.; longitude, 122° 15′ W. Elevation of barometer above sea-level, 332 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.813	29.819	29.776	29.803	30.215	1	29.208	27	1.007	41.2	50.6	46.7	46.2	67.0	23	30.0	17	37.0	54.8	38.2	3.55	1.12	5	36	S.	26 27	N.	5,165
Feb	29.680	29.710	29.664	29.685	30.119	22	29.083	17	1.036	39.7	50.7	47.2	45.9	79.0	25	22.0	14	57.0	55.4	36.8	2.21	1.06	16, 17	38	S.	17	N.	5,376
Mar	29.598	29.611	29.577	29.595	29.940	11	28.983	9	.957	45.3	56.6	52.8	51.6	71.5	1	32.5	11	39.0	60.8	43.1	7.81	2.17	8, 9	42	S.	9	S.	4,974
Apr	29.610	29.619	29.579	29.603	29.884	1	29.282	10	.602	49.4	63.1	57.8	56.8	77.0	7	41.5	17 28	35.5	66.6	47.2	4.81	1.47	14, 15	32	S.	14 15	S.	6,048
May	29.611	29.607	29.558	29.592	29.761	2	29.365	18	.396	58.2	76.6	69.2	68.0	91.0	31	50.5	2	40.5	79.9	56.8	.18	.14	25	24	N.	29	S.	5,004
June	29.587	29.587	29.549	29.574	29.829	24	29.371	20	.458	59.7	77.6	71.4	69.6	94.5	18	52.0	13	42.5	80.9	58.5	.97	.56	13	32	S.	23	S.	4,783
July	29.577	29.580	29.504	29.554	29.709	15 26	29.330	12	.379	64.5	88.0	82.6	78.4	99.0	27 29	56.0	6 7	43.0	91.0	62.6	.00	.00	......	25	S.	6	S.	4,184
Aug	29.549	29.543	29.486	29.526	29.749	28	29.327	10	.422	68.0	91.4	85.2	81.5	107.0	10	55.0	17	52.0	95.1	65.5	(¶)	(¶)	4, 5, 10	20	S.	4	S.	8,402
Sept	29.592	29.597	29.550	29.580	29.818	9	29.279	30	.539	57.4	76.0	68.5	67.8	95.0	1	46.5	9	48.5	80.3	54.5	.36	.17	30	26	N., NW.	4 26	N.	4,521
Oct *	29.658	29.662	29.638	29.653	29.882	21	29.355	9	.527	53.1	70.3	63.0	62.1	87.0	22	41.5	28	45.5	75.8	49.8	.90	.68	12, 13	28	N.	18	N.	3,920
Nov	29.738	29.748	29.725	29.735	29.932	24	29.425	20	.507	47.2	63.0	54.0	54.7	79.0	26	36.0	26	43.0	67.7	44.0	.04	.04	13	18	N.	2 26	N.	2,998
Dec.	29.606	29.618	29.600	29.608	29.959	31	29.070	25	.889	42.9	51.9	47.8	47.5	69.5	2	25.0	13	44.5	56.6	39.7	7.73	2.00	16, 17	48	S.	22	N.	7,782
Sums	355.619	355.696	355.206	355.506	....	...	....	...	7.719	626.6	815.8	746.2	729.6	......	...	......	...	528.0	868.8	596.7	28.06	.....	....	...	....	...	....	58,145
Means	29.635	29.641	29.600	29.625	30.215	†1	28.983	‡9	.643	52.2	68.0	62.2	60.8	107.0	§10	22.0	‖14	44.0	72.0	49.7	.....	.....	....	...	....	...	N.	......

* Eight observations missed. † January. ‡ March. § August. ‖ February. ¶ Inappreciable.

RED BLUFF, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°		°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan	66	0	5	0	14	0	1	8	4	35.2	[illegible].5	37.0	36.5	82.3	62.9	74.8	73.3	3.7	4.7	4.0	4.1	15	8	8	9	0	2	0	0	6	0	6	0	10	3, 4, 5	5	2	1	10
Feb	50	0	1	0	22	0	1	13	0	35.0	34.4	36.7	35.4	84.3	58.9	69.8	70.8	3.2	4.6	3.3	3.7	15	10	4	7	0	7	0	0	8	0	18	1	3	13, 14, 15	6	9	2	10
Mar ...	33	0	1	1	35	0	0	17	6	40.9	41.6	43.0	42.0	85.4	60.9	72.0	73.0	4.9	5.4	4.2	4.8	12	11	8	13	0	0	0	0	*15	0	10	2	10	2	12	2	6	5
Apr ...	20	1	3	2	41	4	3	11	5	45.9	44.7	49.2	46.6	88.8	54.7	74.3	72.6	4.0	5.1	4.3	4.5	12	11	7	10	0	0	0	0	21	0	15	4	0	7	17	0	7	7
May ...	22	1	5	3	42	2	2	11	5	50.0	49.1	52.4	50.5	76.4	40.7	57.5	58.2	3.9	2.7	3.9	3.5	15	11	5	4	0	0	1	2	5	10	1	3	2	31	2	8	4	6
June ...	13	1	8	7	40	0	2	11	8	53.5	51.1	52.1	52.2	81.0	42.6	54.6	59.4	4.6	3.9	4.2	4.2	14	8	8	7	0	0	4	0	4	5	24	2	7	30	1	10	3	1
July ...	19	2	4	9	34	1	0	20	4	49.7	47.2	47.2	48.0	60.5	25.6	30.2	38.8	.6	1.0	.6	.7	28	3	0	0	0	0	19	1	2	5	1	1	2	29, 30, 31	1	3	1	7
Aug ...	14	0	13	5	39	0	0	16	6	52.3	49.6	50.6	50.8	58.5	25.0	31.0	38.2	.4	.7	1.1	.7	30	1	0	0	0	0	26	1	1	2	1–4	0	10	30, 31	0	4	1	0
Sept ...	38	1	8	1	20	0	0	18	9	43.8	42.0	43.1	43.0	63.7	31.5	44.0	46.4	.7	2.3	1.0	1.3	24	6	0	4	0	0	3	2	0	11	9, 10 14–24	0	10	1–3, 11, 12 13, 25–30	0	1	0	10
Oct ..	43	2	8	0	12	0	0	14	6	41.5	41.2	44.3	42.3	67.4	37.8	53.1	52.8	.2	2.0	1.3	1.2	22	5	0	4	0	0	0	1	1	6	15	0	10	1–12	0	8	0	11
Nov ...	48	0	6	1	10	2	0	17	6	40.0	40.3	41.4	40.6	77.5	45.4	63.9	62.3	1.9	3.3	1.4	2.2	24	3	3	1	0	0	0	0	0	11	1–30	0	11	1–30	0	0	0	11
Dec	34	0	5	1	26	2	1	21	3	33.5	34.2	34.3	34.0	72.7	58.6	65.5	65.6	4.5	5.1	3.8	4.5	14	7	10	12	0	6	0	0	16	3	26	0	10	5–17	15	5	4	2
Sums .	400	8	67	30	335	11	10	167	62	521.3	511.9	532.3	521.9	898.5	544.6	690.8	711.4	32.6	40.8	33.1	35.4	225	84	53	71	0	15	53	7	......		......	......		....	63	4	35	8
	Percentages.																					Percentages.																	
Means.	36.7	0.7	6.2	2.8	30.7	1.0	0.9	15.3	5.7	43.4	42.7	44.4	43.5	74.9	45.4	57.6	59.3	2.7	3.4	2.8	3.0	62.2	23.2	14.6	19.6	0	4.1	†14.5	1.9	21	0	‡15	0	10	(§)	5	3.3	2	11.7

* For 23 days. † Percentage for 366 days. ‡ April. § January 3, 4, 5; August, 30, 31; September 1–3, 11–13, 25–30; October 1–12; December 5–17.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.59 a. m., 11.59 a. m., and 7.59 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.010 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.370; February, 0.370; March, 0.370; April, 0.360; May, 0.350; June, 0.350; July, 0.340; August, 0.350; September, 0.350; October, 0.360; November, 0.370; December, 0.370.

REMARKS.—River-gauge carried away by high water, March 9; earthquake, 1 a. m. June 6; brilliant red sunsets, October 17–22, inclusive; cyclone, December 8.

J. R. WILLIAMS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

RIO GRANDE CITY, TEX.

Location of office on December 31, 1884, Clay street, opposite Kelsey's warehouse.

Latitude, 26° 23′ N.; longitude, 98° 48′ W. Elevation of barometer above sea-level, 230 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.083	30.084	30.078	30.065	30.521	20	29.569	10	.952	44.2	60.6	51.5	52.1	85.0	30	21.0	8	64.0	65.8	40.5	.47	.40	15, 16	29	NW.	1	NW.	5,612
Feb	29.849	29.819	29.865	29.844	30.248	14	29.470	18	.778	57.7	77.5	64.4	66.5	92.0	26	33.2	15	58.8	80.2	55.5	.00	.00	......	28	NW.	27	SE.	6,007
Mar	29.775	29.727	29.774	29.759	30.109	14	29.441	24	.668	62.9	83.5	70.3	72.2	98.2	27	32.0	1	66.2	85.6	62.4	.16	.15	18	20	NE., S.	9, 16	SE.	5,838
Apr*	29.735	29.688	29.727	29.717	30.013	23	29.387	14	.626	66.1	86.3	73.0	75.1	101.6	18	45.0	20	56.6	88.7	65.0	.93	.89	4	35	SE.	28	SE.	6,734
May	29.731	29.700	29.744	29.725	30.041	8	29.503	20	.538	71.8	91.7	77.4	80.1	100.6	17	58.0	8	42.6	93.5	70.4	5.15	2.00	19	32	NE.	6	SE.	5,968
June	29.746	29.722	29.743	29.737	29.886	27	29.610	25	.276	74.8	96.6	82.2	84.5	106.2	25	68.0	5	38.2	99.9	74.0	.02	.02	29	25	E.	26	SE.	5,294
July	29.756	29.712	29.749	29.739	29.864	7	29.600	16	.264	78.1	102.1	85.1	88.4	110.0	16	74.0	28	36.0	104.4	76.5	.00	.00	......	24	SE.	16, 21	SE.	7,780
Aug	29.793	29.744	29.793	29.777	29.901	3	29.653	19	.248	78.3	95.6	80.6	83.2	104.9	6	65.7	9	39.2	100.9	75.0	.00	.00	......	25	SE.	27	SE.	5,387
Sept	29.752	29.709	29.757	29.739	29.940	20	29.576	8	.364	75.4	91.9	80.8	82.7	103.2	4	70.0	13, 16	33.2	94.6	74.8	7.80	5.64	10	28	E., SE.	9, 11	SE.	4,580
Oct	29.865	29.830	29.877	29.857	30.058	16	29.642	2	.416	67.8	81.9	72.9	74.2	93.0	7	57.0	28, 29	36.0	84.1	67.0	4.45	1.60	27, 28	28	E., N.	15, 28	E.	3,692
Nov	29.954	29.912	29.968	29.945	30.284	6	29.552	22	.732	58.1	72.2	63.6	64.6	83.6	1	40.6	29	43.0	73.8	57.4	.03	.03	26	21	NW.	28, 29	NW.	3,038
Dec	29.837	29.818	29.851	29.834	30.225	25	29.459	4	.766	52.0	65.6	56.6	58.1	83.1	10	34.0	25, 26	49.1	68.1	49.6	.33	.12	25, 26	24	NW.	5	N.	3,765
Sums ..	357.876	357.410	357.926	357.738	......	...	......	...	6.623	781.7	1,005.5	858.4	881.7	......	...	......	......	562.9	1,039.6	767.6	18.84	....	......	..	....	.....	......	63,695
Means .	29.823	29.784	29.827	29.811	30.521	†20	29.387	‡14	.552	65.1	83.8	71.5	73.5	110.0	§16	21.0	†8	46.9	86.6	64.0	....	....	......	..	....	.....	SE.	......

* Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed.

† January.

‡ April.

§ July.

RIO GRANDE CITY, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	13	10	10	16	8	2	0	28	6	36.8	34.8	39.9	37.2	78.1	40.1	66.8	61.7	3.5	3.8	3.3	3.5	19	6	6	3	0	8	0	0	0
Feb	12	8	10	37	13	0	1	6	0	52.3	47.5	51.5	50.4	83.5	37.1	65.0	61.9	2.2	3.9	2.7	2.9	17	9	3	0	0	0	2	1	0
Mar	8	6	17	39	13	0	0	8	2	55.9	54.4	58.3	56.2	80.6	40.1	67.2	62.6	4.4	4.9	3.2	4.2	13	12	6	2	0	0	7	6	0
Apr	*3	*11	*10	*51	*2	*0	*2	*8	*0	60.4	53.9	59.5	57.9	82.9	37.2	64.2	61.4	2.2	3.8	2.8	2.9	17	7	3	4	0	0	16	6	0
May	5	4	8	71	0	1	0	3	1	66.7	64.3	66.2	65.7	86.2	42.4	69.7	66.1	2.8	4.4	3.7	3.6	11	18	2	10	0	0	26	11	0
June	3	1	15	67	2	0	1	0	1	70.4	63.8	69.4	67.9	86.4	35.9	66.3	62.9	1.7	4.0	1.8	2.5	18	11	1	1	0	0	30	4	0
July	0	1	9	81	2	0	0	0	0	72.1	62.0	70.0	68.0	82.4	27.5	60.9	56.9	.3	1.8	.3	.8	29	2	0	0	0	0	31	1	0
Aug	0	4	31	53	3	0	0	0	2	70.9	62.0	69.4	67.4	85.7	30.3	63.6	59.9	.8	5.3	1.6	2.6	21	9	1	0	0	0	31	9	0
Sept	0	1	30	44	10	0	0	0	5	72.4	67.2	72.4	70.7	90.8	47.7	76.2	71.6	1.4	5.6	2.2	3.1	18	10	2	7	0	0	27	5	0
Oct	8	13	24	17	7	1	4	8	11	65.0	64.7	68.0	65.9	90.7	58.5	84.9	78.0	3.2	7.1	2.8	4.4	13	11	7	12	0	0	8	2	0
Nov	15	9	14	16	3	1	3	18	11	51.7	53.0	53.8	52.8	80.4	53.7	72.2	68.8	4.3	5.1	3.8	4.4	9	16	5	1	0	0	0	0	0
Dec	25	6	11	23	2	1	2	13	10	46.3	48.9	48.4	47.9	82.6	59.8	75.9	72.8	4.6	5.8	4.5	5.0	10	13	8	8	0	0	0	0	0
Sums	92	74	189	515	65	6	13	92	49	720.9	676.5	726.8	708.0	1,010.3	510.3	832.9	784.6	31.4	55.5	32.7	39.9	195	124	44	48	0	8	178	45	0
	Percentages.																					Percentages.								
Means	8.4	6.8	17.3	47.0	5.9	.5	1.2	8.4	4.5	60.1	56.4	60.6	59.0	84.2	42.5	69.4	65.4	2.6	4.6	2.7	3.3	53.7	34.2	12.1	13.2	0	2.2	49.0	12.4	0

*Three observations in April missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.33 a. m., 1.33 p. m., and 9.33 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.250; February, 0.260; March, 0.240; April, 0.240; May, 0.240; June, 0.230; July, 0.230; August, 0.240; September, 0.240; October, 0.240; November, 0.250; December, 0.250.

REMARKS.—January 2, first and only frost during winter of 1883-'84. October 6, brilliant meteor 7.20 p. m. Office moved from Fort Ringgold to Rio Grande City October 31. Elevation of thermometer above ground changed from 5.666 feet to 4.000 feet; elevation of top of rain-gauge above ground changed from 1.133 feet to 1.672 feet.

L. G. SCHULTZ,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ROCHESTER, N. Y.

Location of office on December 31, 1884, Powers building.

[Latitude, 43° 8′ N.; longitude, 77° 42′ W. Elevation of barometer above sea-level, 621 feet. Elevation of exposed thermometer above ground, 149 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.402	29.360	29.377	29.380	30.140	27	28.574	9	1.566	17.3	20.2	17.4	18.3	47.0	30, 31	−10.5	26	57.5	25.1	10.6	5.18	1.24	8, 9	44	W.	9	W.	11,714
Feb	29.346	29.336	29.366	29.349	29.929	15	28.721	28	1.208	25.4	28.8	24.9	26.4	53.5	5	− 6.0	29	59.5	35.5	18.5	1.94	.33	17	48	W.	29	W.	9,841
Mar	29.345	29.323	29.351	29.340	29.725	18	28.809	26	.916	27.7	33.7	29.8	30.4	56.8	25	− 2.0	1	58.8	37.6	23.8	3.30	1.09	9	48	W.	12	W.	9,500
Apr	29.254	29.224	29.253	29.244	29.736	21	28.571	2	1.165	37.5	44.8	40.9	41.1	75.5	27	27.8	5	47.7	48.2	33.9	.94	.50	2	39	W.	28	NW.	8,0[illegible]9
May	29.274	29.247	29.269	29.263	29.605	8	28.920	18	.685	50.4	59.6	52.7	54.2	82.6	23	33.3	30	49.3	63.7	45.6	2.28	1.00	1, 2	60	W.	2	W.	8,785
June	29.453	29.412	29.417	29.427	29.837	15	29.044	9	.793	62.2	73.0	65.7	67.0	86.1	24	46.6	10	39.5	77.2	57.1	4.82	1.80	25	28	NW.	24	SW.	6,042
July	29.221	29.185	29.206	29.204	29.389	3	28.897	31	.492	62.0	70.0	63.3	65.1	79.0	1	38.0	15	41.0	73.2	57.7	3.08	1.87	4, 5	32	W., SW.	6 31	W.	7,492
Aug	29.393	29.352	29.373	29.373	29.692	9	28.934	29	.758	61.7	74.7	65.8	67.4	92.2	20	42.8	25	49.4	77.7	58.5	2.52	.92	4	28	W.	28	SW.	6,673
Sept	29.419	29.380	29.403	29.401	29.856	14	29.022	28	.834	60.0	71.4	63.0	64.8	92.1	7	37.3	19	54.8	76.6	56.1	1.90	.92	24, 25	36	SW.	16	SW.	7,611
Oct	29.453	29.417	29.430	29.433	29.909	26	29.000	8	.909	48.2	55.7	49.7	51.2	84.1	4	24.0	26	60.1	61.8	43.8	1.87	1.08	4	32	SW., NW.	20 25	SW.	8,789
Nov	29.362	29.318	29.357	29.346	29.730	3	28.765	28	.965	34.0	40.6	35.8	36.8	64.9	10	15.4	24	49.5	46.5	30.8	1.82	.44	28, 29	48	W.	7	SW.	8,985
Dec	29.416	29.388	29.409	29.404	30.008	26	28.620	6	1.388	27.8	31.4	28.5	29.1	64.9	31	−10.5	20	75.4	38.2	22.4	2.62	.53	21, 24, 25	*54	W.	15	SW.	*5,888
Sums	352.338	351.942	352.211	352.164	....	...	....	..	11.679	513.7	603.9	537.5	551.8	....	....	......	.....	642.0	661.8	458.8	31.17	....	....	....	....	....	....	†96,799
Means	29.362	29.328	29.351	29.347	30.140	‡27	28.571	§2	.973	42.8	50.3	44.8	46.0	92.2	‖20	−10.5	‡26 ¶20	53.5	55.1	38.2	.....	.....	....	....	....	....	SW.	....

* Total for 16⅓ days only. † For 351⅓ days. ‡ January. § April. ‖ August. ¶ December.

ROCHESTER, N. Y.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	3	8	5	6	6	23	35	7	0	13.4	13.7	11.0	12.7	84.4	76.4	76.6	79.1	8.9	7.8	7.9	8.2	0	11	20	19	22	31	0	0	0
Feb	3	8	10	10	14	7	23	12	0	21.6	22.5	19.9	21.3	85.1	78.4	81.7	81.7	9.2	7.6	6.7	7.8	0	14	15	19	9	24	0	0	0
Mar	8	3	7	13	5	11	26	20	0	22.7	24.8	23.0	23.5	81.1	71.4	75.9	76.1	6.9	6.8	5.2	6.3	4	16	11	12	10	22	0	0	1
Apr	5	18	4	4	6	6	12	34	1	31.0	29.9	31.8	30.9	77.7	60.3	72.0	70.0	7.0	6.9	5.6	6.5	7	8	15	11	0	12	0	0	1
May	6	9	4	11	9	20	23	11	0	42.4	42.4	44.0	42.9	74.8	55.8	73.3	68.0	6.5	7.5	4.6	6.2	4	17	10	13	0	0	0	2	0
June	7	19	9	6	6	26	10	5	2	54.7	55.6	55.4	55.2	76.7	56.4	70.5	67.9	3.5	4.9	3.0	3.8	14	10	6	6	0	0	0	4	0
July	9	6	4	2	7	15	36	14	0	55.5	53.9	55.4	54.9	79.5	58.9	76.4	71.6	5.8	7.0	5.2	6.0	4	17	10	11	0	0	0	4	2
Aug	7	11	1	4	11	33	17	8	1	55.6	55.4	56.4	55.8	80.8	52.6	72.4	68.6	3.9	4.8	3.6	4.1	13	11	7	8	0	0	3	3	0
Sept	10	3	0	3	9	42	13	9	1	52.7	53.7	54.6	53.7	77.9	56.2	75.2	69.8	5.6	6.3	4.5	5.5	4	19	7	11	0	0	2	2	1
Oct	9	2	6	3	13	26	20	13	1	41.2	42.2	42.0	41.8	77.8	62.5	77.0	72.4	7.2	7.5	4.8	6.5	2	16	13	15	0	5	0	2	0
Nov	2	1	6	8	6	29	24	13	1	28.4	31.5	30.8	30.1	80.1	72.2	80.8	77.7	7.3	8.4	6.9	7.5	4	6	20	12	0	16	0	0	0
Dec	2	4	2	15	13	28	22	6	1	22.6	24.6	23.4	23.5	82.5	76.5	81.3	80.1	9.3	8.6	8.5	8.8	1	4	26	17	10	23	0	0	0
Sums ..	71	92	58	85	105	266	261	152	8	441.8	450.2	447.2	446.8	958.4	777.6	913.1	883.0	81.1	84.1	66.5	77.2	57	149	160	154	51	133	5	17	5
	Percentages.																					Percentages.								
Means .	6.5	8.4	5.3	7.7	9.6	24.2	23.8	13.8	.7	36.8	37.5	37.3	37.2	79.9	64.8	76.1	73.6	6.8	7.0	5.5	6.4	15.6	40.7	43.7	42.1	13.9	36.3	1.4	4.6	1.4

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.57 a. m., 2.57 p. m., and 10.57 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., March 31, inclusive, .000 inch; from 7 a. m., April 1, to 11 p. m., December 31, inclusive, +.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.660; June, 0.650; July, 0.650; August, 0.650; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—From 7 a. m., January 1, to 11 p. m., March 31, all barometer readings are too high, about .040 of an inch.

E. W. McGANN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ROSEBURG, OREG.

Location of office on December 31, 1884, Jackson street, between Oak and Washington.

[Latitude, 43° 13′ N.; longitude, 123° 20′ W. Elevation of barometer above sea-level, 523 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 46 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.565	29.580	29.555	29.567	29.971	10	28.799	26	1.172	36.5	41.0	39.9	39.1	63.3	5	25.0	16	38.3	45.8	34.0	3.66	1.53	7, 8	28	SW.	8	E.	2,017
Feb	29.457	29.469	29.448	29.458	29.858	23	28.699	17	1.159	33.5	41.5	40.2	38.4	63.0	23	8.3	13	54.7	47.4	30.3	3.71	.74	15, 16	20	N.	6	NW.	1,946
Mar	29.373	29.383	29.370	29.375	29.754	19	28.795	9	.959	39.5	50.5	47.1	45.7	67.3	3	28.2	8	39.1	55.6	37.4	3.37	.65	8, 9	17	SW.	18	SW.	1,732
Apr	29.404	29.395	29.392	29.397	29.728	3	28.961	10	.767	45.2	56.5	52.6	51.4	78.0	7	35.2	18	42.8	61.2	43.0	3.48	.73	9, 10	28	SW.	23	NW.	2,158
May	29.472	29.447	29.435	29.451	29.669	1	29.134	19	.535	47.8	66.7	61.3	58.6	88.2	31	35.0	4	53.2	71.8	46.6	.85	.68	25	16	N.	28	NW.	1,856
June	29.418	29.400	29.412	29.410	29.651	24	29.166	21	.485	52.8	67.8	62.3	61.0	84.3	17	42.7	27	41.6	72.5	51.9	1.90	.42	25, 26	28	SW.	23	NW.	1,917
July	29.500	29.492	29.464	29.485	29.616	19	29.225	13	.391	54.1	69.7	66.5	63.4	86.5	30	43.3	4	43.2	75.1	52.9	.05	.05	6, 7	16	SW.	6	NW.	2,346
Aug.[1]	29.448	29.418	29.406	29.422	29.601	6	29.159	2	.442	55.8	79.4	73.5	69.6	97.2	2	46.0	15	51.2	85.5	54.3	.08	.03	5	41	NE.	2	NW.	1,412
Sept	......	......	......	......	......	...	......	...	....	....	......	......	......	......	...	......	..	....	....	....	[2].61	[2].54	30	...	....	....	NW.	[3]615
Oct	......	......	......	......	......	...	......	...	.....	45.9	56.2	51.6	51.2	75.7	8	33.9	3	41.8	64.5	43.6	1.15	.51	17	...	....	....	NW.	1,302
Nov.[4]	29.539	29.549	29.543	29.544	29.793	26	29.280	9 10	.513	43.8	51.0	47.3	47.4	69.7	4	29.8	30	39.9	58.0	41.2	.79	.31	8, 9	...	....	....	NW.	665
Dec	29.877	29.898	29.885	29.887	29.853	7	28.696	25	1.157	35.3	39.3	37.6	37.4	61.7	18	19.2	10	42.5	45.7	31.1	9.20	2.53	16, 17	...	....	....	SW.	1,581
Sums	......	......	......	......	......	...	......	...	.....	.....	......	......	......	.....	..	......	...	.....	.....	.....	......	....	......	...	....	....	....	......
Means	......	......	......	......	......	...	......	...	.....	.....	......	......	......	.....	..	......	...	.....	.....	.....	......	....	......	...	....	....	NW.	......

[1] For 13 days only.

[2] For 11 days only.

[3] For 9½ days only.

[4] One 3 p. m. and one 11 p. m. observation missed.

ROSEBURG, OREG.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	10	11	21	5	16	10	1	6	13	32.5	33.5	34.5	33.5	85.9	76.0	82.1	81.3	5.8	6.2	5.2	5.7	9	10	12	10	0	13	0	0	0
Feb	8	3	6	3	10	11	4	15	27	29.8	33.3	33.8	32.3	86.1	73.1	78.2	79.1	5.3	5.9	5.2	5.5	7	12	10	13	3	10	0	0	0
Mar	6	4	7	1	1	19	7	9	39	35.7	39.7	38.7	38.0	86.2	67.5	73.6	75.8	6.1	7.3	5.6	6.3	3	15	13	16	0	2	0	0	0
Apr	9	4	8	1	8	11	6	19	24	41.1	44.8	43.4	42.9	86.1	64.8	71.8	74.2	7.0	7.6	6.7	7.1	4	8	18	17	0	0	0	2	0
May	14	1	3	0	0	5	7	27	36	43.5	48.3	47.2	46.3	85.1	52.6	61.2	66.3	4.6	4.6	3.7	4.3	10	16	5	6	0	0	0	2	0
June	13	3	4	2	6	4	1	29	28	48.5	51.2	50.3	50.0	85.7	56.1	65.8	69.2	6.7	6.8	6.5	6.7	3	11	16	16	0	0	0	1	0
July	15	4	1	0	2	1	12	33	25	49.0	50.1	49.4	49.5	83.1	50.8	55.2	63.0	6.7	6.0	3.7	5.5	8	14	9	2	0	0	0	0	0
Aug.[1]	8	0	1	0	0	1	4	22	18	50.0	51.9	52.0	51.3	81.1	38.8	47.9	55.9	2.0	1.3	1.8	1.7	21	10	0	1	0	0	3	2	0
Sept	6	1	0	0	11	10	3	21	38	......	......	......	......	......	......	......	......	5.0	6.7	4.3	5.3	7	14	9	3	0	0	0	0	0
Oct	4	3	3	2	5	5	4	18	49	43.0	47.2	47.2	45.8	89.8	72.7	85.4	82.6	4.8	6.2	3.3	4.8	9	17	5	9	0	0	0	2	0
Nov.[4]	9	8	3	2	2	4	2	10	48	41.9	45.3	44.5	43.9	94.8	81.6	89.1	88.5	2.4	5.3	3.6	3.8	11	15	3	10	0	1	0	0	0
Dec	11	6	5	2	13	15	6	8	27	33.8	33.6	34.6	33.8	92.9	80.5	89.0	87.5	7.6	8.0	6.7	7.4	2	11	18	19	1	16	0	0	0
Sums ..	113	48	62	18	74	96	57	217	372	......	......	......	......	......	......	......	......	64.0	71.9	56.3	64.1	94	153	118	122	4	42	3	9	0
	Percentages.																					Percentages.								
Means.	10.7	4.5	5.9	1.7	7.0	9.1	5.4	20.5	35.2	......	......	......	......	......	......	......	......	5.3	6.0	4.7	5.3	25.7	41.9	32.3	*34.6	†1.1	†11.9	†0.9	†2.5	0

* Percentage for 353 days.

† Percentage for 352 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.55 a. m., 11.55 a. m., and 7.55 p. m., local time.

Corrections for instrumental error of barometer used: From 3.55 a. m., January 1, to 7.55 p. m., August 18, inclusive, +.001 inch; from 11.55 a. m., October 25, to 7.55 p. m., December 31, 1884, inclusive, +.001.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.580; February, 0.580; March, 0.570; April, 0.570; May, 0.560; June, 0.550; July, 0.550; August, 0.550; November, 0.580; December, 0.580.

REMARKS.—Re-establishing station; office destroyed by fire about 1.15 a. m., August 19; no observations of barometers or thermometers made during September; elevation of barometer changed from 511 feet, in old office, to 523½ feet, in new office, October 25, 11.55 a. m.; elevation of thermometers changed from maximum 20 feet 9½ inches, minimum 20 feet 11 inches, exposed 20 feet 5 inches, wet-bulb 20 feet 4 inches, in old office, to maximum 54 feet, minimum 54 feet 7 inches, exposed 53 feet 10 inches, wet-bulb 53 feet 10 inches, in new office; elevation of rain-gauge changed from 23 feet 4½ inches, in old office, to 45 feet 6 inches in new office; no self-register in use since opening new office.

J. J. NANRY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SACRAMENTO, CAL.

Location of office on December 31, 1884, Lyon and Curtis Building.

[Latitude, 38° 35′ N.; longitude, 121° 30′ W. Elevation of barometer above sea-level, 64 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.100	30.106	30.064	30.090	30.510	1	29.534	26	.976	41.3	50.6	48.0	46.6	61.0	22	31.0	11	30.0	55.9	37.9	3.43	1.00	29, 30	30	SE.	27	SE.	4,279
Feb[1]	29.962	29.998	29.952	29.971	30.356	22	29.347	6	1.009	42.2	50.2	48.3	46.9	71.0	26	21.0	13	50.0	56.1	38.9	4.46	1.36	16, 17	33	S.	17	N.	5,170
Mar[2]	29.886	29.914	29.885	29.895	30.226	11	29.439	9	.787	48.6	56.3	53.8	52.9	70.5	1	39.0	12	31.5	60.7	46.7	8.14	2.94	8, 9	35	S.	27	N.	6,787
Apr	29.909	29.928	29.899	29.912	30.179	1	29.554	10	.625	51.0	61.4	57.6	56.7	74.2	21	40.0	27	34.2	65.8	49.5	4.32	1.37	9	27	SE.	10	SW.	5,609
May	29.885	29.906	29.867	29.886	30.047	2	29.681	18	.366	57.0	70.2	64.9	64.0	85.0	8	50.5	6	34.5	75.4	55.7	.06	.03	25	26	SW.	25	S.	5,772
June[2]	29.869	29.896	29.862	29.876	30.075	14, 24	29.703	12	.372	58.7	72.2	66.5	65.8	92.0	18	52.9	13	39.1	76.3	57.6	1.45	.82	11, 12	22	SW.	21	S.	5,506
July	29.851	29.882	29.829	29.854	30.029	15	29.707	12	.322	61.6	78.8	73.2	71.2	96.0	11	54.5	6	41.5	85.4	60.1	.00	.00	......	24	SW.	5	S.	5,778
Aug	29.813	29.843	29.794	29.817	30.018	4	29.659	10	.359	63.1	80.9	73.5	72.5	100.0	8, 10	54.0	18	46.0	88.7	60.8	([3])	([3])	4	18	SW.	16	S.	5,234
Sept	29.861	29.885	29.839	29.862	30.094	15	29.547	30	.547	56.5	72.4	65.4	64.8	93.5	1	49.0	6	44.5	79.5	53.5	.60	.30	7, 8, 30	27	NW.	26	S.	4,347
Oct	29.913	29.934	29.904	29.917	30.122	27	29.673	9	.449	52.6	66.0	61.0	59.9	80.5	8	42.0	8	38.5	72.1	49.6	2.01	1.70	12, 13	20	SW.	12	SE., N.	3,495
Nov	30.012	30.022	29.998	30.011	30.196	24	29.718	20	.478	48.2	61.2	56.4	55.3	75.2	6	37.7	23	37.5	67.6	44.7	......	......	......	22	SE.	12	N.	2,817
Dec	29.896	29.901	29.884	29.894	30.228	31	29.421	25	.807	44.8	51.7	49.8	48.8	65.0	1, 3	27.0	12	38.0	56.2	41.6	10.45	2.44	24, 25	36	NW.	6	SE.	7,817
Sums ..	358.957	359.215	358.777	358.985	......	....	......	...	7.097	625.6	771.9	718.4	705.4	......	......	......	...	465.3	839.7	596.6	34.92	....	......	...	....	....	....	62,611
Means .	29.913	29.935	29.898	29.915	30.510	[4]1	29.347	[5]6	.591	52.1	64.3	59.9	58.8	100.0	[6]8, 10	21.0	[5]13	38.8	70.0	49.7	.....	....	......	...	....	...	S.	......

[1] One 7 a. m. observation missed. [2] One 11 p. m. observation missed. [3] Inappreciable. [4] January. [5] February. [6] August.

SACRAMENTO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—						River.											
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Nothwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 90°.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
										°	°	°	°															Ft.	In.		Ft.	In.		Ft.	In	Ft.	In.
1884.																																					
Jan....	20	4	4	26	12	1	1	17	8	38.2	42.0	41.9	40.7	89.1	73.4	80.0	80.8	3.6	5.5	3.7	4.3	13	10	8	9	2	0	13	6	31	7	10	5, 23–25	5	8	9	1
Feb[1]...	31	3	2	12	14	6	4	13	1	39.4	40.4	41.7	40.5	89.7	70.8	78.6	79.7	3.4	4.0	2.9	3.4	16	5	7	10	6	0	17	7	18	10	1	15	7	6	13	1
Mar[2]..	22	2	2	21	14	17	4	8	2	44.7	45.4	45.4	45.2	86.7	68.2	74.1	76.3	4.9	5.5	3.6	4.7	13	7	10	13	0	0	22	6	15	14	0	3, 4	8	6	20	1
Apr ...	4	0	5	16	25	28	5	6	1	47.1	48.1	49.5	48.2	86.9	62.5	74.5	74.6	3.9	5.2	4.4	4.5	13	7	10	9	0	0	23	6	20–22	19	9	7, 8	3	9	21	9
May...	3	0	0	14	31	30	2	13	0	51.3	53.4	54.7	53.1	81.4	55.7	69.8	69.0	3.5	3.5	1.8	2.9	19	9	3	3	0	0	22	10	1	22	0	31	0	10	22	3
June[3]..	1	0	3	13	39	23	3	6	1	53.1	56.5	55.7	55.1	81.7	58.7	69.1	69.8	3.8	4.1	2.9	3.6	18	5	6	7	0	1	22	0	1	19	4	30	2	8	20	9
July...	0	0	0	21	35	22	3	11	1	52.7	56.9	57.0	55.5	73.0	47.6	57.7	59.4	.4	.6	.1	.4	29	2	0	0	0	7	19	4	1	11	6	31	7	10	14	10
Aug...	1	0	0	18	33	31	2	7	1	54.1	60.5	58.0	57.5	73.1	50.3	58.9	60.8	.3	.6	.3	.4	29	2	0	0	0	13	11	6	1	8	7	31	2	11	10	0
Sept...	2	1	0	20	23	20	5	18	1	49.2	52.0	52.3	51.2	77.1	49.7	63.4	63.4	.1	1.6	.6	.8	27	3	0	3	0	1	8	9	13–14	7	9	30	1	0	8	4
Oct....	20	1	1	20	14	14	3	14	6	46.7	50.9	51.7	49.8	81.2	59.8	72.5	71.2	2.0	1.6	.8	1.5	26	4	1	4	0	0	10	1	15	7	9	1, 2	2	4	8	5
Nov ...	27	5	2	9	10	14	4	6	13	44.0	47.2	47.1	46.1	85.5	60.7	71.7	72.6	1.7	2.6	1.4	1.9	22	6	2	0	0	0	8	0	21–23	7	10	24–30	0	2	7	11
Dec ...	18	2	3	30	17	7	2	13	1	38.2	39.4	39.2	38.9	78.9	65.2	69.2	71.1	3.9	4.6	4.4	4.3	13	8	10	11	5	0	24	7	27	7	6	8–17	17	1	13	8
Sums..	149	18	22	220	267	213	38	132	36	558.7	592.7	594.2	581.8	984.3	722.6	839.5	848.7	31.5	39.4	26.9	32.7	238	68	57	69	13	22	....		......	....		....	61	8	170	2
	Percentages.																					Percentages.															
Means.	13.6	1.6	2.0	20.1	24.4	19.4	3.5	12.1	3.3	46.6	49.4	49.5	48.5	82.0	60.2	70.0	70.7	2.6	3.3	2.2	2.7	65.6	18.7	15.7	18.9	3.6	6.0	24	7	*27	7	6	*8–17	5	1	14	2

* December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.02 a. m., 12.02 p. m., and 8.02 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., July 21, inclusive, —.001 inch. From 7 p. m., July 21, to 11 p. m., December 31, 1884, inclusive, +.003. (Extra barometer 244 used as station barometer on and after the 7 p. m. observation July 21.)

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—Barometer reduction: Constant changed on and after February 1 from 0.080 to 0.070 of an inch for all months. Office moved from Arcade Building, 1006 Second street, to Lyon & Curtis Building, 117 I street, after the 11 p. m. observation of January 31, and before the 7 a. m. observation of February 1. Change in elevation of instruments as follows, viz: Barometer cistern, old elevation, 67.64 feet; new elevation, 63.91 feet; thermometer standard, old elevation, 37.10 feet; new elevation, 32.07 feet; rain-gauge elevation, 57.98 feet; new elevation, 56.65 feet. Old elevation used during January; new elevation used from February 1 to date. Last killing frost February 14; last light frost March 30; first killing frost December 9; first light frost October 1.

JAMES A. BARWICK, *Sergeant, Signal Corps, U. S. A.*

Meteorological summary for the year ending December 31, 1884—Continued.

SAINT MICHAEL'S, FORT, ALASKA.

[Latitude, 63° 28′ N.; longitude, 161° 48′ W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.697	29.708	29.697	29.701	30.648	31	29.019	21	1.629	-.8	4.6	4.0	3.1	39.0	28	—38.0	24	77.0	11.9	—8.5	.57	.12	15–17	...	......	.....	NE.	[1]2,251
Feb	30.136	30.139	30.114	30.130	30.637	1	29.094	23	1.543	9.4	12.1	14.8	11.9	37.0	27	—26.0	1	63.0	19.8	4.4	.17	.08	26	[2]52	SW.	27	NE.	[2]3,208
Mar	29.720	29.720	29.705	29.715	30.179	6	29.216	21	.963	12.4	13.3	15.5	13.7	43.5	8	—10.0	19, 27, 28	53.5	20.0	6.8	.78	.23	2, 3	42	NE.	1	N.	9,965
Apr	29.959	29.966	29.948	29.958	30.499	7	29.399	30	1.100	20.8	23.1	25.5	23.0	41.5	30	—10.0	1	51.5	29.0	16.7	.26	.10	2	68	S.	13	NE.	9,486
May	29.741	29.752	29.743	29.745	30.204	21	29.331	13	.873	31.2	35.4	37.2	34.6	52.0	30	11.0	8	41.0	40.7	28.5	.25	.14	18 19	30	NW.	23	N.	4,695
June	29.850	29.869	29.845	29.855	30.206	22, 30	29.462	15	.744	44.2	47.8	50.1	47.4	60.5	6	31.0	8	29.5	54.1	40.5	.77	.21	2	38	SW.	29	W.	6,914
July	29.848	29.847	29.818	29.838	30.193	1	29.508	19	.685	50.1	58.1	54.4	52.5	67.5	31	44.0	8	23.5	57.4	48.2	4.00	.68	4, 5	32	S.	1, 19	S.	7,815
Aug	29.816	29.834	20.810	29.820	30.077	12	20.329	28	.748	53.4	55.7	58.0	55.7	69.0	21	31.5	31	37.5	60.9	49.7	1.40	.55	3, 4	44	N.	26	N.	6,843
Sept	29.758	29.756	29.754	29.756	30.152	3, 7	29.141	14	1.011	39.8	40.8	40.6	40.4	60.0	12	18.0	29	42.0	45.0	35.5	5.04	1.05	19, 20	76	S.	14	SW.	10,553
Oct	29.793	29.800	29.790	29.797	30.426	21	28.760	1	1.666	22.2	21.8	23.1	22.4	34.0	5	6.0	25	28.0	27.2	16.2	1.46	.95	1, 2	50	E.	1	E.	8,821
Nov	29.548	29.552	29.533	29.544	30.116	20	28.859	30	1.257	16.5	16.2	16.3	16.3	36.0	20, 29	—18.0	18	54.0	22.8	9.6	.60	.20	22, 23	48	NE.	19	N.	10,466
Dec	29.988	29.980	29.950	29.938	30.577	10	28.729	6	1.848	12.7	13.6	13.4	13.2	42.0	18	—20.0	14	62.0	20.3	5.6	.20	.05	1, 2	64	E.	12, 13	E.	10,687
Sums	357.799	357.873	357.716	357.797	......	.....	......	..	14.067	318.0	337.5	352.4	33.42	....	.....	.....	....	562.5	406.6	258.2	15.50	....	......	...	......	.....	......	[3]90,699
Means	29.818	29.823	29.810	29.816	30.648	([4])	28.729	([5])	1.172	26.1	28.1	29.4	27.8	69.0	([6])	—38.0	([4])	46.9	34.0	21.5	.....	....	......	...	......	.....	N.	......

[1] For 8 days only.

[2] For 12 days only.

[3] For 327 days only.

[4] January.

[5] December.

[6] August.

SAINT MICHAEL'S, FORT, ALASKA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	11	40	9	5	12	6	8	0	2	.1	4.0	3.0	2.4	97.3	97.3	95.7	96.8	5.8	5.8	5.7	5.8	12	5	14	12	24	31	0	0	1
Feb	12	31	1	3	20	4	3	0	13	7.5	10.1	12.6	10.0	91.8	91.4	92.6	91.9	5.1	4.9	5.4	5.1	11	6	12	4	23	29	0	0	1
Mar	37	14	10	2	5	14	3	0	8	10.8	11.8	14.0	12.2	93.2	94.1	93.4	93.6	6.0	6.1	6.6	6.2	7	9	15	13	22	31	0	0	4
Apr	15	17	14	7	15	10	1	0	11	18.3	20.0	22.5	20.3	91.9	88.5	88.4	89.6	6.3	6.0	6.3	6.2	6	13	11	6	14	24	0	0	4
May	23	12	9	1	2	11	6	10	19	29.2	30.9	31.9	30.7	92.4	83.7	81.7	85.8	5.4	5.3	4.8	5.2	9	11	11	5	0	24	0	0	0
June	16	15	7	0	10	9	17	6	10	40.7	39.5	41.5	40.6	88.1	74.2	73.6	78.6	6.0	6.1	5.3	5.8	6	14	10	10	0	1	0	0	0
July	8	11	14	7	31	4	10	4	4	47.7	48.0	49.1	48.3	91.5	83.1	82.5	85.8	8.8	9.0	9.1	9.0	1	4	26	21	0	0	0	0	0
Aug	32	16	4	0	4	10	11	7	9	49.0	49.7	49.5	49.4	86.1	80.7	74.1	80.3	5.9	6.7	6.7	6.4	6	9	16	9	0	1	0	1	2
Sept	12	11	11	10	13	14	6	9	4	37.7	37.9	37.3	37.6	92.7	90.3	90.0	91.0	7.2	7.9	7.9	7.7	0	14	16	22	3	6	0	0	1
Oct	14	15	25	8	11	6	3	4	7	19.6	19.3	20.4	19.8	89.4	89.5	89.0	89.3	4.5	5.2	6.3	5.3	8	13	10	6	28	31	0	0	8
Nov	25	23	11	9	7	4	4	3	4	14.8	14.0	14.4	14.4	92.8	90.9	92.1	91.9	5.2	6.3	6.7	6.1	7	12	11	11	22	30	0	0	2
Dec	12	20	22	4	11	9	1	0	14	9.3	10.4	9.8	9.8	86.1	86.7	85.0	85.9	3.2	3.9	4.2	3.8	15	7	9	2	25	31	0	0	5
Sums	217	225	137	56	141	101	73	43	105	284.7	295.6	306.0	205.5	1093.3	1050.4	1037.6	1060.5	69.4	73.2	75.0	72.6	88	117	161	121	161	239	0	1	28
	Percentages.																					Percentages.								
Means	19.8	20.5	12.5	5.1	12.8	9.2	6.6	3.9	9.6	23.7	24.6	25.5	24.6	91.1	87.5	86.5	88.4	5.8	6.1	6.2	6.0	24.0	32.0	44.0	33.1	44.0	65.3	0	0.3	7.7

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 1.21 a. m., 9.21 a. m., and 5.21 p. m., local time.

Corrections for instrumental error of barometer used: From 1.21 a. m., January 1, to 5.21 p. m., December 31, 1885, inclusive, +.027 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.4; February, 0.4; March, 0.4; April, 0.3; May, 0.3; June, 0 3; July, 0.3; August, 0.3; September, 0.3; October, 0.3; November, 0.3; December, 0.4.

FRED. H. CLARKE,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAINT PAUL, MINN.

Location of office on December 31, 1884, Presley Block, No. 104 East Third street.

[Latitude, 44° 58′ N.; longitude, 93° 3′ W. Elevation of barometer above sea-level, 801 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 61 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.272	29.239	29.254	29.255	29.756	5	28.498	13	1.258	2.9	12.9	7.9	7.9	45.0	29	—31.5	4	76.5	20.8	—3.0	.48	.20	9, 10	24	SE.	27	W.	4,258
Feb	29.169	29.144	29.159	29.157	29.654	19	28.502	18	1.152	7.2	18.7	13.9	13.3	45.0	16	—18.0	15	63.0	24.4	1.6	1.27	.25	4, 5	27	S.	18	NW.	4,401
Mar	29.128	29.118	29.136	29.127	29.536	13	28.172	11	1.364	21.8	34.6	28.1	28.2	59.5	28	—12.0	4	71.5	37.7	18.4	1.34	.42	18, 19	34	SE.	10	SE., NW.	5,091
Apr	29.109	29.074	29.096	29.093	29.686	21	28.408	27	1.278	39.8	52.8	46.5	46.4	71.5	25	21.9	7	49.6	56.0	37.6	2.00	.70	27	37	SE.	29	NW.	7,470
May	29.090	29.054	29.061	29.069	29.525	29	28.753	22	.772	51.9	66.4	58.6	59.0	81.0	8, 17	34.0	2	47.0	69.9	48.9	2.09	.76	22	27	NW.	18	NW.	5,553
June......	29.164	29.133	29.138	29.145	29.418	14	28.805	7 24	.523	63.8	76.7	68.5	69.7	90.0	24	47.5	2	42.5	80.6	60.4	3.57	1.43	7	32	NW.	30	SE.	5,078
July......	29.074	29.050	29.048	29.057	29.344	20	28.784	22	.560	63.0	76.4	68.8	69.2	88.0	2	51.5	6 13	36.5	80.5	60.2	2.93	1.03	29	29	NW.	24	W.	4,632
Aug	29.132	29.104	29.106	29.114	29.478	8	28.824	29	.654	62.4	76.5	67.8	68.9	89.5	15	49.5	4	40.0	79.5	59.6	2.89	1.29	24, 25	46	SE.	19	SE.	6,190
Sept......	29.064	29.032	29.057	29.051	29.486	12	28.685	2	.801	57.6	71.1	62.2	63.6	87.0	5	43.5	20	43.5	73.1	54.6	4.48	1.38	8, 9	28	S., SW., NW., S.	5 8 10 29	SE.	5,894
Oct	29.170	29.145	29.162	29.159	29.574	14	28.665	5	.909	46.7	57.7	50.9	51.8	81.0	2	23.0	23	58.0	61.5	43.4	2.43	.93	1, 2	27	W., SE.	5, 25	NW.	6,051
Nov	29.206	29.189	29.205	29.200	29.563	5	28.736	26	.827	26.4	37.6	31.7	31.9	60.8	14	— 5.8	24	66.6	41.8	23.9	.65	.40	22	20	NW.	16 17	NW.	2,976
Dec	29.222	29.197	29.221	29.213	29.826	25	28.673	8	1.153	12.1	18.2	14.2	14.8	49.2	8	—27.0	25	76.2	22.7	7.0	1.96	.54	6, 7	30	W.	8	NW.	5,522
Sums ..	349.800	349.479	349.646	349.640	......	...	......	...	11.251	455.6	599.6	518.6	524.7	....	...	......	...	670.9	648.0	412.6	26.11	....	......	...	....	....	......	63,111
Means .	29.150	29.123	29.137	29.137	29.826	*25	28.172	†11	.938	38.0	50.0	43.2	43.7	90.0	‡24	—31.5	§4	55.9	54.0	34.4	.....	..	......	...	....	....	NW.	......

* December. † March. ‡ June. § January.

SAINT PAUL, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.					
										Washington time.																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Thunder-storms.	Auroras.	Highest.	Date.	Lowest.	Date.	Range.	Mean.
1884.										°	°	°	°																	Ft. In.		Ft. In.		Ft. In.	Ft. In.
Jan....	3	3	0	11	7	11	23	18	17	2.0	10.1	6.0	6.0	92.2	83.1	90.5	88.6	4.6	5.3	3.9	4.6	10	16	5	9	23	31	0	0	Frozen.					
Feb....	11	3	2	10	10	7	10	23	11	1.3	6.9	5.3	4.5	77.9	61.8	69.7	69.8	7.3	7.1	6.4	6.9	2	14	13	19	21	29	0	0						
Mar...	5	3	4	19	8	12	15	19	8	14.4	20.3	18.6	17.8	74.5	57.8	69.0	67.1	6.2	6.6	4.5	5.8	7	13	11	10	11	19	0	0	*9 2	31	4 0	24	5 2	7 5.6
Apr...	19	10	2	18	7	4	9	20	1	31.1	33.7	33.5	32.8	71.2	50.5	61.7	61.1	6.3	6.4	6.0	6.2	8	7	15	9	0	5	1	0	9 10	8	6 0	27	3 10	7 6.2
May...	7	8	7	10	11	5	12	24	9	44.7	48.9	48.6	47.4	77.3	56.0	70.8	68.0	5.1	5.5	4.0	4.9	12	11	8	10	0	0	2	0	10 3	5, 6, 7	6 11	22	3 4	8 5.9
June...	10	5	2	32	21	4	2	2	12	59.3	64.4	62.2	62.0	85.4	66.7	80.8	77.6	4.9	6.9	4.2	5.3	5	18	7	13	0	0	11	0	7 3	1	4 2	30	3 1	5 9.8
July...	4	2	2	9	9	6	23	22	16	58.0	61.4	62.1	60.5	83.8	60.8	81.0	75.2	4.0	6.7	4.7	5.1	5	22	4	11	0	0	4	1	4 2	1	2 4	23	1 10	3 4.0
Aug...	5	1	1	25	22	10	11	15	3	57.2	61.2	60.2	59.5	83.5	60.1	77.1	73.6	4.4	6.9	4.6	5.3	8	17	6	11	0	0	4	0	3 1	30, 31	1 10	10	1 8	2 6.6
Sept...	7	2	3	22	19	9	7	8	13	53.1	57.3	55.7	55.4	84.9	62.8	79.9	75.9	4.5	6.1	4.1	4.9	10	12	8	13	0	0	8	2	4 10	12	3 1	4, 7	1 9	3 9.4
Oct....	8	2	2	16	20	9	10	22	9	40.7	43.7	42.5	42.3	79.9	61.2	73.7	71.6	4.5	6.0	4.8	5.1	9	18	9	10	0	5	0	0	6 6	10	3 10	1	2 8	5 5.9
Nov...	8	3	1	8	9	9	12	18	27	19.5	25.1	24.9	23.2	75.3	61.4	76.4	71.0	3.7	5.4	4.8	4.6	11	10	9	7	7	19	0	0	5 8	1, 2, 3	2 4	23	2 11	4 2.6
Dec....	11	1	0	11	12	12	10	29	7	5.4	9.1	7.4	7.3	74.2	67.8	74.9	72.3	5.5	7.0	5.6	6.0	9	7	15	15	23	31	0	0	Frozen.					
Sums..	88	43	26	191	155	98	144	220	133	386.7	442.1	427.0	418.7	960.1	750.0	905.5	871.8	61.0	75.9	57.6	64.7	96	160	110	137	85	139	30	3	......	......	......	......	......	......
	Percentages.																					Percentages.													
Means.	8.0	3.9	2.4	17.4	14.1	8.9	13.1	20.0	12.1	32.2	36.8	35.6	34.9	80.0	62.5	75.5	72.7	5.1	6.3	4.8	5.4	26.2	43.7	30.1	37.4	23.2	38.0	8.2	.8	......	......	......	......	......	......

* For 8 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.56 a. m., 1.56 p. m., and 9.56 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.940; February, 0.930; March, 0.910; April, 0.880; May, 0.840; June, 0.840; July, 0.830; August, 0.830; September, 0.850; October, 0.870; November, 0.910; December, 0.950.

REMARKS.—April 21, last frost of the season; October 9, first light frost of the season; October 22, first killing frost of the season; October 22, first snow of the season.

P. F. LYONS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAINT VINCENT, MINN.

Location of office on December 31, 1884, west end of village.

[Latitude, 48° 56′ N.; longitude, 97° 14′ W. Elevation of barometer above sea-level, 804 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain gauge above ground, 14 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.*	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	29.292	29.265	29.278	29.278	29.914	4	28.427	12	1.487	—11.0	—3.0	—9.6	— 7.9	36.3	17	—41.0	3, 4	77.3	3.9	—20.8	.14	.06	29, 30	38	S.	24	NW.	7,341
Feb	29.266	29.231	29.251	29.249	29.956	11	28.414	18	1.542	—13.6	—2.0	—8.3	— 8.0	30.0	24	—37.0	7	67.0	2.8	—19.7	.24	.07	26	26	NW.	1, 18	NW.	5,119
Mar	29.143	29.143	29.134	29.140	29.583	29	28.488	11	1.095	3.0	17.8	11.3	10.7	38.2	26	—27.0	6	65.2	22.7	— 0.9	.38	.18	30	20	NW. S.	2, 11 14	S., NW.	4,659
Apr	29.196	29.173	29.185	29.185	29.791	20	28.691	30	1.100	29.8	42.1	34.9	35.6	67.5	24	18.0	6	49.5	46.3	27.1	.80	.26	29, 30	34	NW.	19	N.	4,755
May	29.131	29.097	29.098	29.109	29.424	29	28.693	19	.731	44.6	62.9	50.7	52.7	85.1	17	29.3	1	55.8	67.3	40.0	1.11	.07	30	23	NW.	19	NW.	6,209
June.....	29.092	29.075	29.071	29.079	29.306	1	28.780	10	.526	58.7	74.8	65.1	66.2	90.1	22	39.0	9	51.1	79.5	54.5	2.63	.76	12, 13	29	N.	28	S.	6,139
July	29.059	29.033	29.043	29.045	29.297	19	28.777	22	.520	53.1	69.9	59.3	60.8	83.1	21	41.2	6	41.9	72.6	50.2	3.47	1.49	16, 17	25	NW.	5	NW.	5,261
Aug	29.062	29.046	29.048	29.052	29.409	8	28.671	2	.735	53.8	71.4	60.0	61.7	88.8	27	38.0	23	50.8	74.4	50.9	7.18	4.39	1, 2	42	SW.	24	NW.	6,354
Sept	28.995	28.954	28.982	28.977	29.450	12	28.523	2	.927	46.2	63.3	51.7	53.7	80.0	5	32.0	27	48.0	65.5	43.7	3.44	1.50	15	33	SE., S.	13, 20	NW.	6,662
Oct	29.115	29.081	29.089	29.095	29.548	20	28.484	5	1.064	36.0	49.4	40.5	42.0	75.4	15	10.2	31	65.2	52.8	32.1	1.15	.39	2, 3	38	S.	8	NW.	8,467
Nov	29.212	29.194	29.209	29.205	29.666	17	28.619	19	1.047	17.0	28.4	21.0	22.1	58.7	13	—19.1	23	77.8	31.9	12.6	.42	.14	18, 19	37	NW.	19	NW.	6,318
Dec......	29.240	29.244	29.208	29.251	29.744	18	28.597	3	1.147	— 2.4	5.3	—0.7	— 0.7	44.8	2, 3	—47.8	23	92.6	10.4	— 9.2	.85	.30	28, 20	30	NW.	8	NW.	6,550
Sums ..	349.803	349.536	349.656	349.665	......	...	....	...	11.921	315.2	480.3	375.9	390.3	......	...	....	...	742.2	580.1	260.5	21.81	....	......	...	....	.....	....	73,829
Means .	29.150	29.128	29.138	29.139	29.956	*11	28.414	*18	.993	26.3	40.0	31.3	32.5	90.1	†22	—47.8	‡23	61.8	44.2	21.7	.....	....	......	...	....	.....	NW.	......

* February.

† June.

‡ December.

SAINT VINCENT, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	16	2	0	7	29	4	3	32	0	—13.2	— 6.7	—11.8	—10.6	91.1	84.3	90.6	88.7	3.0	4.5	2.4	3.3	15	13	3	5	30	31	0	0	1
Feb	15	1	0	6	17	14	2	28	4	—18.1	— 7.7	—13.4	—13.1	79.4	75.9	77.2	77.5	4.8	6.1	2.9	4.6	8	17	4	10	29	29	0	0	1
Mar	10	0	1	8	24	6	1	24	19	— 1.3	12.2	6.5	5.8	81.5	78.0	80.2	79.9	2.9	4.4	2.3	3.2	17	10	4	5	19	31	0	0	4
Apr	25	2	2	12	20	4	0	15	10	26.0	31.7	29.3	29.0	85.5	69.4	80.1	78.3	5.6	5.3	5.0	5.3	10	8	12	9	0	21	0	1	2
May	17	6	5	7	22	10	0	26	0	39.9	42.1	42.6	41.5	84.0	49.5	74.5	69.3	3.4	4.6	1.8	3.3	17	12	2	3	0	3	0	1	0
June	11	7	2	14	30	14	2	9	1	55.7	62.1	58.7	58.8	90.0	66.0	80.3	78.8	5.2	5.1	4.2	4.8	8	15	7	10	0	0	1	12	1
July	12	6	6	11	7	7	14	26	4	51.2	58.5	55.1	54.9	93.1	68.2	86.4	82.6	4.7	7.1	4.1	5.3	7	16	8	13	0	0	0	7	0
Aug	9	2	6	9	22	10	7	24	4	52.1	58.9	55.8	55.6	94.0	65.5	86.2	81.9	4.9	5.5	3.8	4.7	9	18	4	12	0	0	0	8	2
Sept	6	2	10	5	18	11	18	20	0	43.7	48.4	46.8	46.3	90.9	60.0	83.7	78.2	4.7	6.9	3.9	5.2	7	17	6	10	0	0	0	3	2
Oct	3	2	7	13	17	7	13	28	3	32.1	35.8	34.0	34.0	85.8	61.8	77.9	75.2	5.2	5.8	4.0	5.0	9	13	9	10	2	15	0	0	0
Nov	9	1	2	5	25	4	10	33	1	13.7	20.4	17.0	17.0	86.6	72.2	84.1	81.0	4.1	5.7	4.8	4.9	8	15	7	10	17	29	0	0	1
Dec......	7	4	1	5	16	12	13	35	0	— 4.1	— 1.1	— 3.4	— 2.9	92.5	74.9	88.4	85.3	4.0	5.3	4.4	4.6	13	11	7	12	25	31	0	0	2
Sums ..	140	35	42	102	247	103	83	300	46	277.7	354.6	317.2	316.3	1,054.4	825.7	989.6	956.7	52.5	66.3	43.6	54.2	128	165	73	109	122	190	1	32	16
	Percentages.																					Percentages.								
Means	12.8	3.2	3.8	9.3	22.5	9.4	7.6	27.3	4.2	23.1	29.6	26.4	26.4	87.9	68.8	82.5	79.7	4.4	5.5	3.6	4.5	35.0	45.1	19.9	29.8	33.3	51.9	0.3	8.7	4.4

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.39 a. m., 1.39 p. m., and 9.39 p. m., local time.
Correction for instrumental error of barometer used: From 5.39 a. m., January 1, to 9.39 p. m., December 31, 1884, inclusive, + .001 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.980; February, 0.970; March, 0.940; April, 0.910; May, 0.860; June, 0.850; July, 0.840; August, 0.850; September, 0.870; October, 0.900; November, 0.980; December, 0.990.

REMARKS.—Meteor observed 7.30 p. m., January 21, moving from east to west, in the north. Solar halo, with parhelic circle, December 26. Last frost of spring, May 20; first frost of autumn, September 20.

W. H. FALLON,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SALT LAKE CITY, UTAH.

Location of office on December 31, 1884, Wasatch building, southeast corner of Main and Second South streets.

[Latitude, 40° 46′ N.; longitude, 111° 54′ W. Elevation of barometer above sea-level, 4,348 feet. Elevation of exposed thermometer above ground, 52 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	25.778	25.774	25.777	25.776	26.278	1	25.281	29	.997	24.6	34.1	28.5	29.1	52.4	28	1.6	1	50.8	36.0	20.8	.71	.36	2	32	SE.	29	SE.	3,257
Feb	25.587	25.593	25.599	25.593	26.021	22	24.916	6	1.105	27.3	36.0	30.5	31.3	53.3	25	—13.0	13	66.3	38.9	22.5	2.23	.82	5, 6	32	NW.	18	NW.	4,075
Mar	25.499	25.513	25.507	25.506	25.862	13	24.980	10	.882	36.4	45.3	40.0	40.6	57.8	18	23.8	21	34.0	48.6	33.1	3.69	1.12	19, 20	36	W.	10	SE.	4,662
Apr	25.524	25.516	25.537	25.526	25.812	2	25.117	27	.695	42.6	54.5	46.9	48.0	70.2	9	34.3	4	35.9	56.7	39.3	2.89	.45	12, 13	34	NW.	25	NW.	4,443
May	25.604	25.603	25.595	25.601	25.904	7	25.381	21	.523	51.0	64.4	57.6	57.7	83.7	9	35.7	4	48.0	67.7	48.1	1.78	.55	3, 4	24	W., SW.	4, 15	NW.	4,613
June	25.594	25.592	25.571	25.586	25.822	17	25.409	13	.413	60.2	77.9	68.0	68.7	91.8	26	47.7	15	44.1	80.4	57.8	.33	.13	5	30	S., SE.	1, 13	SE.	4,875
July	25.625	25.626	25.588	25.613	25.839	8	25.407	13	.432	63.3	83.8	73.1	73.4	93.2	13	54.0	23	39.2	86.8	61.2	.27	.16	12	28	SE.	6	SE.	4,023
Aug	25.666	25.664	25.646	25.659	25.862	29	25.396	18	.466	63.5	82.5	71.8	72.6	91.7	4	49.0	21	42.7	84.3	61.1	.73	.38	8	36	SW.	16	NE.	3,492
Sept	25.603	25.601	25.567	25.590	25.858	15	25.100	30	.753	52.0	67.0	57.5	58.8	86.6	4	37.0	10	49.6	70.2	48.6	1.91	.80	6, 7	29	NW.	26	SE.	3,844
Oct	25.668	25.678	25.688	25.678	25.973	16	24.931	1	1.042	47.1	60.4	50.3	52.6	79.5	17	31.7	27	47.8	62.6	43.4	.36	.18	19	32	SW.	1	SE.	3,947
Nov	25.783	25.776	25.784	25.781	26.048	30	25.365	21	.683	36.1	50.4	39.7	42.1	64.3	7	26.0	30	38.3	51.5	32.8	.50	.45	17	15	NW.	1	NW.	2,422
Dec	25.488	25.487	25.510	25.495	25.985	31	25.095	21	.890	32.2	39.4	38.4	35.5	52.8	18	6.6	31	46.2	41.7	23.7	2.12	.80	21, 22	32	S.	19	SE.	5,410
Sums ..	307.419	307.423	307.369	307.404	....	...	....	...	8.881	536.8	695.7	598.7	610.4	.....	...	......	..	542.9	725.4	497.4	17.52	....	......	...	....	....	....	49,063
Means .	25.618	25.619	25.614	25.617	26.278	*1	24.916	†6	.740	44.7	58.0	49.9	50.9	93.2	‡13	—13.0	†13	45.2	60.4	41.4	.....	....	......	...	....	....	SE.	......

* January. † February. ‡ July.

SALT LAKE CITY, UTAH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	1	1	7	24	6	3	8	13	30	12.3	17.6	14.3	14.7	58.6	50.6	54.5	54.6	4.3	5.3	3.3	4.3	12	12	7	3	13	23	0	0	0
Feb	4	3	4	18	10	3	3	20	22	15.9	20.9	16.8	17.9	60.8	54.7	56.1	57.2	5.6	6.4	4.5	5.5	6	15	8	8	6	18	0	0	0
Mar	1	10	5	26	9	2	5	13	22	25.6	29.3	26.1	27.0	64.2	54.3	57.2	58.6	6.2	7.2	5.7	6.4	5	12	14	11	0	14	0	3	0
Apr	4	8	9	16	4	6	2	17	24	30.1	32.5	31.6	31.4	62.4	45.7	56.7	54.9	6.8	7.0	4.6	6.1	6	12	12	16	0	0	0	2	0
May	7	14	12	12	4	7	6	17	14	36.7	40.1	38.2	38.3	58.9	43.6	50.3	50.9	4.2	5.7	3.9	4.6	11	14	6	9	0	0	0	5	0
June	14	8	11	21	8	1	4	14	9	40.7	40.8	41.4	41.0	49.8	29.1	39.4	39.4	2.5	5.1	2.8	3.5	13	15	2	4	0	0	3	3	0
July	13	8	6	26	3	0	0	16	21	37.0	37.0	38.2	37.4	38.5	20.5	29.8	29.6	1.1	2.1	2.2	1.8	24	7	0	2	0	0	10	3	0
Aug	11	16	5	15	4	4	2	14	22	40.6	41.9	41.7	41.4	44.0	24.8	36.0	34.9	2.7	3.8	2.8	3.1	18	10	3	3	0	0	3	3	0
Sept	8	5	5	20	4	3	4	16	25	34.1	35.4	34.6	34.7	52.7	35.8	45.4	44.6	3.5	3.6	2.9	3.4	15	11	4	7	0	0	0	1	0
Oct	10	7	8	19	9	1	11	17	11	34.3	35.1	33.7	34.4	61.6	41.4	54.1	52.4	3.6	3.8	2.5	3.3	16	11	4	5	0	1	0	1	0
Nov	5	9	13	7	3	2	9	17	25	23.6	26.3	25.4	25.1	60.3	40.7	56.4	52.5	2.2	4.8	1.6	2.9	19	9	2	2	0	9	0	0	0
Dec	6	3	3	21	16	5	6	19	14	21.5	24.7	22.7	23.0	63.6	56.4	61.1	60.4	5.3	7.2	6.3	6.3	8	7	16	11	3	22	0	0	0
Sums	84	92	88	225	80	37	60	193	239	352.4	381.6	364.7	366.3	675.4	497.6	597.0	590.0	48.0	62.0	43.1	51.2	153	135	78	81	22	87	16	21	0
	Percentages.																					Percentages.								
Means	7.6	8.4	8.0	20.5	7.3	3.3	5.5	17.6	21.8	29.4	31.8	30.4	30.5	56.3	41.5	49.8	49.2	4.0	5.2	3.6	4.3	41.8	36.9	21.3	22.1	6.0	23.8	4.4	5.7	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.41 a. m., 12.41 p. m., and 8.41 p. m., local time.

Correction for instrumental error of barometer used: From 4.41 a. m., January 1, to 8.41 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.570; February, 4.560; March, 4.520; April, 4.370; May, 4.320; June, 4.220; July, 4.180; August, 4.190; September, 4.250; October, 4.400; November, 4.570; December, 4.540.

REMARKS.—January, two lunar halos during month. February 13, thermometer 13° below zero; snow-slide at Park City, Utah; three lives lost. March, snow-slide at Alta, Utah, 7th; twelve lives lost. April, high wind 25th. May, floods during month throughout Territory. June, floods during month throughout Territory. September, first light frost of season 10th; snow on mountains 7th. November, first heavy frost of season, 3d. December, lowest monthly mean barometer for December recorded.

JOHN CRAIG,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAN DIEGO, CAL.

Location of office on December 31, 1884, corner Fifth and D streets.

[Latitude, 32° 43′ N.; longitude, 117° 10′ W. Elevation of barometer above sea-level, 67 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.					
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.					
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.039	30.042	30.051	30.044	30.348	1	29.770	25	.578	49.0	62.8	53.2	55.0	77.5	12	38.7	2	38.8	64.5	45.6	1.34	.92	28, 29	31	S.	28	NE.	4,343
Feb	29.948	29.974	29.975	29.966	30.180	19	29.523	6	.657	51.7	61.4	54.5	55.9	79.0	24	37.8	14	41.2	62.9	48.6	9.05	1.89	2, 3	32	W.	6	NW.	4,937
Mar	29.928	29.965	29.955	29.949	30.128	8	29.742	3	.386	52.4	61.3	55.7	56.5	67.9	1	43.0	24, 30	24.9	62.9	50.4	6.23	1.71	14, 15	30	W.	23	W.	5,480
Apr	29.928	29.952	29.946	29.942	30.113	1	29.727	27	.386	53.5	62.9	56.4	57.6	68.8	9	44.8	28	24.0	64.4	51.1	2.84	1.01	9, 10	22	S.	10	W.	4,470
May	29.905	29.927	29.924	29.919	30.029	2	29.756	18	.273	57.8	66.1	60.2	61.4	72.8	27	47.0	2	25.8	67.5	56.1	2.17	1.45	14, 15	18	S.	14	W.	4,275
June	29.866	29.898	29.883	29.882	30.032	14	29.717	25	.315	59.8	70.1	63.3	64.4	81.0	30	50.0	14	31.0	72.1	58.4	.31	.24	12, 13	20	S.	12	W.	4,478
July	29.853	29.894	29.861	29.863	29.967	18	29.737	1, 4	.230	63.5	75.0	66.8	68.4	84.0	10	53.7	16	30.3	76.4	61.9	.00	.00	......	18	NW.	12	W.	4,195
Aug	29.834	29.846	29.842	29.841	29.978	4	29.733	6	.245	64.8	75.5	68.2	69.5	91.5	15	54.0	19	37.5	77.4	63.8	(*)	(*)	15, 26	20	W.	22, 28	W.	4,367
Sept	29.842	29.861	29.853	29.852	30.026	15	29.620	30	.406	60.2	71.8	63.9	65.1	78.0	10	51.2	16	26.8	72.2	59.3	.07	.07	3	19	NW.	27	NW.	4,195
Oct	29.881	29.896	29.901	29.892	30.061	17	29.628	1	.433	56.5	67.8	59.6	61.3	87.0	22	47.0	6	40.0	68.8	54.3	.35	.23	19	22	E.	22	W.	4,084
Nov	29.941	29.934	29.955	29.943	30.069	23	29.710	21	.359	53.3	66.5	55.9	58.6	74.0	6	42.0	27	32.0	67.6	49.5	.11	.10	21	18	W.	6	W.	3,234
Dec	29.906	29.911	29.925	29.914	30.145	31	29.578	12	.567	50.2	59.7	53.8	54.4	68.8	5	36.0	15	32.8	60.6	46.9	5.12	1.66	8	26	SW.	11	W.	4,639
Sums ..	358.871	359.077	935.071	359.007	....	...	....	...	4.835	672.7	800.4	711.0	728.1	....	....	......	......	384.1	817.3	645.4	27.59	....	....	...	....	.....	....	52,947
Means .	29.906	29.923	29.923	29.917	30.348	†1	29.523	‡6	.403	56.1	66.7	59.2	60.7	91.5	§15	36.0	‖15	55.0	68.1	53.8	.....	....	....	...	....	.....	W.	......

* Inappreciable. † January. ‡ February. § August. ‖ December.

SAN DIEGO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1885.										°	°	°	°																	
Jan	10	27	10	6	8	9	6	17	0	37.5	40.4	43.4	40.4	67.3	48.6	72.8	62.9	2.5	3.7	3.9	3.4	14	12	5	6	0	0	0	0	0
Feb	6	13	5	9	11	8	15	16	4	44.2	45.8	47.6	45.9	77.1	60.0	78.5	71.9	5.5	6.5	3.9	5.3	8	12	9	15	0	0	0	0	0
Mar	3	14	7	4	18	1	27	19	0	47.1	48.9	48.9	48.3	82.9	65.2	78.4	75.5	6.0	6.2	5.4	5.9	5	16	10	16	0	0	0	0	0
Apr	17	6	5	2	5	8	24	21	2	50.1	51.9	51.1	51.0	88.4	68.0	82.6	79.7	6.4	5.4	4.4	5.4	3	21	6	10	0	0	0	0	0
May	10	5	6	2	3	7	32	27	1	54.5	55.2	55.1	54.9	88.9	68.7	83.6	80.4	7.3	5.5	6.2	6.3	2	19	10	10	0	0	0	1	0
June	10	9	3	2	9	8	27	22	0	56.5	57.1	57.8	57.1	88.8	64.0	82.4	78.4	6.2	4.9	5.4	5.5	8	12	10	4	0	0	0	0	0
July	9	8	0	1	3	20	26	23	3	60.2	61.3	61.5	61.0	88.9	62.5	83.1	78.2	6.9	1.3	3.1	3.8	9	22	0	0	0	0	0	0	0
Aug	8	3	1	2	8	9	30	28	4	61.1	62.3	52.1	61.8	88.2	64.1	81.0	77.8	6.6	1.5	2.7	3.6	10	20	1	0	0	0	1	1	0
Sept	10	4	2	1	2	12	26	18	1	55.4	57.0	56.9	56.4	84.6	61.0	78.5	74.7	4.2	1.4	3.6	3.1	17	10	3	1	0	0	0	0	0
Oct	19	8	5	2	3	9	29	32	2	52.8	54.6	53.6	53.5	86.4	63.7	81.7	77.3	3.5	2.4	3.1	3.0	18	9	4	4	0	0	0	0	0
Nov	16	13	8	0	3	2	23	20	5	47.9	52.2	51.9	50.7	83.1	61.8	86.9	77.1	4.1	1.4	1.4	2.3	15	14	1	2	0	0	0	0	0
Dec	11	7	11	5	7	5	27	18	2	44.6	47.6	48.4	46.9	82.8	66.1	83.8	77.6	5.8	4.7	4.7	5.1	8	15	8	13	0	0	0	2	0
Sums	129	117	63	36	80	98	292	259	24	611.4	634.8	638.8	627.5	1007.4	753.2	973.8	911.5	65.0	44.9	47.8	52.7	117	182	67	81	0	0	1	4	0
	Percentages.																					Percentages.								
Means	11.7	10.7	5.7	3.3	7.3	8.9	26.6	23.6	2.2	51.0	52.9	53.2	52.4	84.0	62.8	81.1	76.0	5.4	3.7	4.0	4.4	32.0	49.7	18.3	22.1	0	0	0.3	1.1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, —.020 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—March 25, last frost of season; March 26, hail-storm; April 27, hail-storm; October 22, desert wind; December 12, hail-storm; December 15, killing frost, first of season; no injury to crops.

J. C. SPRIGG, JR.,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANDUSKY, OHIO.

Location of office on December 31, 1884, corner Water and Columbus streets.

[Latitude, 41° 25′ N.; longitude, 82° 40′ W. Elevation of barometer above sea-level, 639 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 66 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°		°	*In.*	*In.*						*Miles.*
Jan	29.433	29.395	29.450	29.426	30.044	26	28.780	2	1.264	18.5	23.4	20.5	20.8	52.0	30	—10.7	5	62.7	26.9	12.9	1.25	.39	30	34	SW.	2	SW.	8,675
Feb	29.344	29.324	29.332	29.333	29.838	15	28.593	19	1.245	29.1	32.3	31.3	30.9	62.0	19	— 2.8	29	64.8	39.0	24.4	5.48	1.24	4, 5	52	W.	20	W.	7,804
Mar	29.349	29.325	29.333	29.336	29.772	30	28.705	26	1.067	32.0	37.3	35.4	34.9	64.5	23	6.0	2	58.5	41.6	28.7	3.26	.79	28, 29	39	SW.	11	NW.	9,693
Apr.	29.261	29.238	29.253	29.251	29.664	21	28.555	15	1.109	41.4	48.1	45.3	44.9	72.9	27	30.1	3	42.8	52.1	39.3	1.50	.92	2	41	N.	2, 20	NE.	10,407
May.	29.285	29.255	29.271	29.270	29.640	29	28.904	19	.736	55.8	64.7	58.3	59.6	86.9	22	42.0	29	44.9	68.8	51.3	3.70	.71	1	42	W., N.	2, 29	SW.	9,788
June......	29.405	29.371	29.369	29.382	29.706	15	28.976	9	.730	67.0	73.8	69.0	69.9	88.0	24	53.2	10	34.8	77.9	62.7	2.42	1.82	9, 10	44	N.	9	E.	8,150
July	29.243	29.222	29.225	29.230	29.455	8	29.007	5	.448	67.5	75.4	70.7	71.2	91.0	1	57.1	9	33.9	79.8	64.4	5.75	1.64	31	41	NW.	5	{SW.} {NW.}	7,847
Aug	29.383	29.342	29.356	29.360	29.625	9	29.005	28	.620	66.6	75.1	69.5	70.4	92.9	20	53.5	5, 6	39.4	78.6	63.6	2.48	1.50	28	30	N.	7	SW.	7,588
Sept	29.407	29.363	29.389	29.386	29.767	13	29.049	24	.718	64.6	74.0	67.9	68.8	90.0	4	48.4	19	41.6	76.9	62.1	3.17	.94	23	42	SW.	24	SW.	8,167
Oct	29.470	29.430	29.439	29.446	29.826	14	29.098	8	.728	52.7	61.0	56.0	56.6	86.0	3, 4	30.0	24	56.0	64.6	50.4	1.18	.35	27	49	N.	8	SW.	9,215
Nov	29.381	29.354	29.398	29.376	29.743	6	28.736	28	1.007	37.1	43.9	39.1	40.0	65.0	10	14.0	24, 25	51.0	47.0	33.3	1.01	.26	23	44	W.	28	SW.	10,098
Dec	29.420	29.392	29.425	29.412	29.923	26	28.630	6	1.293	29.1	33.4	30.2	30.9	62.0	30	—11.3	19	73.3	37.0	23.2	2.44	.62	6	45	W.	9	SW.	10,380
Sums ..	352.381	352.011	352.285	352.206	......	...	....	...	10.965	561.4	642.4	593.2	598.9	.....	...	......	.....	608.7	690.2	516.3	33.64	....	......	...	....	...	....	107,757
Means .	29.365	29.334	29.358	29.351	30.044	*26	28.555	†15	.914	46.8	53.5	49.4	49.9	92.9	‡20	—11.3	§19	50.8	57.5	43.0	.....	....	......	...	....	...	SW.	....

* January. † April. ‡ August. § December.

SANDUSKY, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan.	10	3	5	1	8	50	12	9	0	11.1	13.6	12.4	12.4	72.5	66.1	70.7	69.8	6.9	7.1	6.6	6.9	5	10	16	14	16	29	0	1	0
Feb.	2	16	10	7	8	13	17	13	1	22.9	23.5	24.6	23.7	77.2	69.8	75.8	74.3	7.9	8.0	7.4	7.8	2	10	17	19	5	23	0	0	1
Mar.	10	18	10	9	8	17	8	18	0	25.6	26.8	27.7	26.7	76.9	66.4	72.9	72.1	6.5	7.3	6.1	6.6	4	11	16	16	8	15	0	2	0
Apr.	15	19	10	7	6	9	8	16	0	33.0	33.8	34.7	33.8	72.5	58.9	67.6	66.3	6.3	5.7	5.7	5.9	7	10	13	8	0	1	0	0	0
May	10	9	4	5	13	29	9	14	0	46.8	48.0	48.2	47.7	72.2	57.0	70.2	66.5	5.5	5.7	4.7	5.3	9	10	12	10	0	0	0	3	0
June	2	16	25	11	16	14	3	3	0	59.3	60.4	61.0	60.2	76.8	64.5	76.3	72.5	3.1	4.9	4.6	4.2	11	13	6	7	0	0	0	4	0
July	9	6	10	7	7	20	14	20	0	57.6	57.0	59.6	58.1	71.4	54.3	69.2	65.0	4.9	5.0	4.1	4.7	9	17	5	11	0	0	1	4	0
Aug.	11	11	7	4	13	24	13	10	0	57.2	59.1	59.4	58.6	72.3	58.8	71.1	67.4	3.2	3.9	1.9	3.0	18	11	2	6	0	0	8	1	0
Sept	4	6	10	6	11	40	6	7	0	56.1	58.1	57.4	57.2	74.7	59.7	70.2	68.2	4.7	4.8	2.9	4.0	10	16	4	9	0	0	0	1	1
Oct	7	7	7	8	7	36	14	7	0	44.8	46.6	46.5	46.0	75.2	60.7	71.7	69.2	4.3	5.1	4.1	4.5	12	12	7	7	0	1	0	1	0
Nov.	7	5	3	3	8	30	15	19	0	30.0	31.8	31.6	31.1	75.3	63.5	74.7	71.2	6.5	6.1	5.4	6.0	7	10	13	9	3	11	0	0	0
Dec.	5	8	5	13	17	25	21	4	0	22.6	24.5	23.7	23.6	76.4	69.5	76.5	74.1	6.7	8.4	7.5	7.5	8	8	20	21	10	23	0	0	0
Sums	92	114	106	81	117	307	140	140	1	467.0	483.2	486.8	479.1	893.4	749.2	866.9	836.6	66.5	71.5	61.0	66.4	97	138	131	137	42	103	4	17	2
	Percentages.																					Percentages.								
Means.	8.4	10.4	9.7	7.4	10.7	28.0	12.8	12.8	0.1	38.9	40.3	40.6	39.9	74.4	62.4	72.2	69.7	5.5	6.0	5.1	5.5	26.5	37.7	35.8	37.4	11.5	28.1	1.1	4.6	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time.

Correction for instrumental error of barometer used: From 6.38 a. m., January 1, to 10.38 p. m., December 31, 1884, inclusive, —.011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.700; May, 0.670; June, 0.670; July, 0.660; August, 0.660; September, 0.670; October, 0.690; November, 0.720; December, 0.780.

B. F. HOUGH,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANDY HOOK, N. J.

Location of office on December 31, 1884, Atlantic and Pacific Telegraph Company's building.

[Latitude, 40° 28′ N.; longitude, 74° 0′ W. Elevation of barometer above sea-level, 28 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.142	30.089	30.113	30.115	30.832	27	29.116	9	1.716	25.5	29.9	27.6	27.7	50.0	9	8.0	6, 7	42.0	33.6	21.2	6.76	2.85	8, 9	58	E.	8, 9	W.	15, 215
Feb	30.066	30.038	30.097	30.067	30.730	16	29.157	28	1.573	34.7	38.2	34.5	35.8	62.5	6	6.0	29	56.5	41.7	29.0	4.72	.97	23	62	NW.	29	E.	10, 893
Mar	30.028	29.965	30.012	30.002	30.443	16	29.489	26	.954	34.9	41.7	37.3	38.0	63.6	12	6.9	1	56.7	44.0	32.2	4.32	1.10	19, 20	61	NW.	30	NW.	12, 014
Apr	29.853	29.788	29.847	29.829	30.164	22	29.102	2	1.062	44.3	52.2	45.1	47.2	67.0	30	34.0	3	33.0	54.0	41.2	3.15	.94	2, 3	57	NW.	4	NW.	12, 155
May	29.946	29.900	29.947	29.931	30.299	31	29.563	11	.736	55.6	64.8	56.4	58.9	86.0	22	45.0	29, 30	41.0	66.8	52.0	5.27	1.69	6, 7	64	E.	7	NW.	11, 246
June	30.083	30.051	30.061	30.065	30.523	15	29.734	9	.789	65.0	73.8	66.5	68.4	91.2	21	51.3	1	39.9	75.7	61.4	4.52	3.62	25, 26	50	E.	26	S.	9, 881
July	29.865	29.814	29.839	29.839	29.998	26	29.563	13	.435	67.6	75.9	69.5	71.0	89.9	23	59.7	30	30.2	77.4	64.8	6.42	1.65	4, 5	49	N.	23	NW.	10, 498
Aug	30.050	30.014	30.033	30.032	30.829	25	29.685	30	.644	69.2	75.4	70.5	71.7	91.3	20	59.0	25	32.3	78.4	67.0	5.12	1.17	22	40	NW.	30	S.	8, 032
Sept	30.114	30.055	30.086	30.085	30.475	14	29.726	17	.749	66.0	77.1	68.2	70.4	94.1	7	51.7	14	42.4	79.7	63.6	0.03	.02	30	39	{ N., NW. }	{18, 20}	SW.	9, 740
Oct	30.153	30.083	30.125	30.120	30.570	26	29.707	8	.863	53.7	62.4	55.6	57.2	81.1	1	35.1	26	46.0	65.5	49.9	4.21	1.61	30, 31	52	NW.	18	NW.	12, 831
Nov	30.084	30.041	30.055	30.060	30.452	3	29.464	28	.988	41.4	48.2	43.8	44.5	62.4	23	22.1	25	40.3	51.8	37.8	3.57	1.26	28, 29	64	NW.	24	W.	12, 783
Dec	30.178	30.125	30.137	30.147	30.671	27	29.565	6	1.136	33.9	38.3	36.2	36.1	61.8	31	0.8	20	60.5	43.6	29.9	5.64	1.78	21	60	N.	19	N., E.	13, 861
Sums ..	360.562	359.963	360.352	360.292	......	...	....	...	11.645	591.8	677.9	611.2	626.9	......	..	...	......	520.8	712.2	550.0	53.78	......	......	...	....	....	......	139, 149
Means .	30.047	29.997	30.028	30.024	30.832	*27	29.102	†2	.970	49.3	56.5	50.9	52.2	94.1	‡7	0.8	§20	48.4	59.4	45.8	......	......	......	...	....	....	NW.	....

* January. † April. ‡ September. § December.

SANDY HOOK, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	8	13	7	1	5	15	27	17	0	17.6	20.5	20.7	19.6	72.2	60.5	75.4	72.4	5.1	5.8	4.3	5.1	10	18	8	14	13	28	0	0	0
Feb	9	14	18	3	5	5	14	16	3	30.2	31.7	29.5	30.5	83.8	78.4	82.3	81.5	6.5	5.9	5.1	5.8	5	15	9	16	2	17	0	0	0
Mar	8	16	8	6	9	8	18	24	1	28.4	32.0	31.5	30.6	77.5	70.2	80.0	75.9	6.6	6.5	5.3	6.1	6	14	11	16	4	12	0	0	0
Apr	16	7	6	14	10	8	8	26	0	38.6	41.3	38.9	39.6	80.9	67.7	79.6	76.1	6.4	5.8	4.9	5.7	8	11	11	9	0	0	0	1	0
May	2	9	7	13	15	12	13	22	0	48.5	47.4	48.3	48.1	78.0	56.6	75.8	70.1	5.1	5.5	3.8	4.6	9	17	5	11	0	0	0	0	0
June	2	4	21	11	23	12	17	0	0	57.5	57.8	58.1	57.8	77.1	59.6	75.1	70.6	2.9	4.0	2.8	3.2	17	10	3	5	0	0	1	2	0
July	6	3	7	5	16	17	13	25	1	60.7	61.4	61.3	61.1	79.3	63.4	76.3	73.0	5.5	5.5	4.2	5.1	6	18	7	15	0	0	0	8	0
Aug	10	11	6	12	18	17	13	4	2	63.8	64.7	64.9	64.5	83.5	70.5	83.0	79.0	5.6	5.6	4.7	5.3	9	13	9	9	0	0	1	3	0
Sept	9	3	5	9	19	25	12	8	0	59.4	61.8	60.8	60.7	79.8	60.2	77.9	72.6	3.6	4.0	2.3	3.3	16	11	3	2	0	0	4	0	0
Oct	11	14	6	3	10	17	7	25	0	45.5	48.6	46.2	46.8	74.9	62.7	72.1	69.9	4.7	5.3	4.0	4.7	14	10	7	13	0	0	0	0	0
Nov	13	15	0	2	3	16	24	17	0	34.2	36.2	36.1	35.5	76.0	64.5	75.1	71.9	4.7	4.7	4.0	4.5	14	10	6	10	0	5	0	0	0
Dec	17	12	17	3	1	14	14	15	0	28.7	30.8	30.5	30.0	81.4	75.5	80.1	79.0	6.1	6.7	6.5	6.4	5	13	13	15	6	13	0	0	0
Sums	111	121	108	82	134	156	180	199	7	513.1	534.2	526.8	524.8	944.4	798.8	932.7	892.0	62.8	65.3	51.4	59.8	119	155	92	135	25	75	6	14	0
	Percentages.																					Percentages.								
Means	10.1	11.0	9.9	7.5	12.2	14.2	16.4	48.1	0.6	42.8	44.5	43.9	43.7	78.7	66.6	77.7	74.3	5.2	5.4	4.3	5.0	32.5	42.4	25.1	36.9	6.8	20.5	1.6	3.8	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

REMARKS.—February 22, last frost; March 6, last snow; August 10, 2.05 p. m., decided earthquake shock; October 15, first frost; October 24, first killing frost; December 18, first snow.

J. McN. WRIGHT,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANFORD, FLA.

Location of office on December 31, 1884, De Forest building.

[Latitude, 28° 48′ N.; longitude, 81° 23′ W. Elevation of barometer above sea level, 36 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.180	30.127	30.174	30.160	30.488	21	29.724	8	.764	50.0	63.5	53.2	55.6	81.5	24	28.5	21	53.0	66.3	46.4	.91	.50	19	26	SW.	8	NW.	5,972
Feb	30.098	30.035	30.085	30.073	30.278	10	29.694	28	.584	59.9	73.8	62.2	65.3	83.5	19	40.4	29	43.1	75.6	57.0	4.40	2.50	16	28	NW.	20	SE.	4,530
Mar	30.078	30.006	30.055	30.046	30.303	4	29.806	26	.497	63.0	77.0	65.1	68.4	88.5	25	43.0	1, 3	45.5	79.0	60.0	.94	.56	26	26	SW.	19	SW.	5,451
Apr	29.963	29.890	29.947	29.933	30.149	29	29.583	6	.566	65.1	78.7	65.4	69.7	91.5	30	49.0	25	42.5	80.9	60.7	1.90	.95	6	28	SW.	2	SW.	5,065
May	29.977	29.911	29.956	29.948	30.166	3	29.773	26	.393	74.0	85.3	71.4	76.9	94.7	20	63.2	8, 10	31.5	88.3	67.3	1.62	.72	5	31	NE.	30	SW.	4,721
June	29.971	29.924	29.955	29.950	30.087	27	29.773	11	.314	75.5	81.9	72.9	76.8	94.8	9, 27	62.6	2	32.2	87.2	68.7	9.57	2.85	10, 11	33	NE.	6	E.	4,627
July	29.963	29.914	29.948	29.942	30.068	24	29.794	8	.274	78.5	87.7	77.7	81.3	97.4	6	69.8	5	27.6	92.6	73.8	5.57	1.03	21	28	SW.	20	SW., W.	3,704
Aug	29.977	29.925	29.977	29.960	30.112	19	29.788	30	.324	76.7	86.7	76.6	80.0	96.6	1	70.1	31	26.5	92.0	74.2	11.09	2.14	16	26	NE.	26	NE.	3,209
Sept	29.995	29.947	29.987	29.976	30.145	26	29.806	9	.339	76.4	82.7	76.0	78.4	94.8	11	64.0	17	30.8	88.7	71.5	3.83	1.11	20, 21	28	NE.	14	NE.	4,307
Oct	30.014	29.989	30.012	30.005	30.240	20	29.815	9	.425	71.8	80.3	71.2	74.4	94.0	9	55.5	18	38.5	84.5	66.1	3.02	1.75	14	64	N.	15	NE.	6,198
Nov	30.048	29.983	30.032	30.021	30.148	24	29.687	28	.461	63.0	73.8	63.8	66.9	85.5	1	44.4	25	41.1	76.9	56.8	1.45	.48	28	26	N.	6	N.	4,584
Dec	30.110	30.040	30.092	30.081	30.260	19	20.830	6	.430	62.2	71.9	62.3	65.5	84.6	12	37.4	8	47.2	74.5	54.3	2.51	1.56	6	20	N.	19	N.	3,735
Sums ..	360.374	359.691	360.220	360.095	....	...	....	...	5.371	816.1	943.3	817.8	859.2	....	....	......	....	459.5	986.5	756.8	46.81	....	....	...	....	....	....	56,108
Means	30.031	29.974	30.018	30.008	30.488	*21	29.583	†6	.448	68.0	78.6	68.2	71.6	97.4	‡6	28.5	*21	38.3	82.2	63.1	.....	....	....	...	....	....	NE.	......

* January. † April. ‡ July.

SANFORD, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
										Washington time.																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	17	2	7	7	16	3	30	2	46.7	50.0	48.3	48.3	88.4	62.7	83.4	78.2	5.1	5.6	2.9	4.5	11	11	9	7	0	4	0	0	0
Feb	3	16	2	22	9	15	2	13	5	56.3	56.0	56.6	56.3	88.3	54.5	82.2	75.0	4.4	4.0	2.6	3.7	16	10	3	9	0	0	0	3	0
Mar	4	9	3	18	8	23	5	16	7	57.6	58.8	59.3	58.6	83.0	54.5	81.1	72.9	3.7	5.4	2.9	4.0	13	14	4	10	0	0	0	3	0
Apr	0	6	0	11	7	37	4	21	4	58.2	56.0	58.2	57.5	79.2	47.9	77.9	68.3	3.0	4.0	1.1	2.7	19	9	2	6	0	0	2	3	0
May	2	14	10	9	5	23	18	10	2	67.8	64.1	66.1	65.7	81.4	51.7	80.9	71.3	3.7	5.0	1.5	3.4	15	15	1	8	0	0	14	9	0
June	0	12	32	11	5	18	9	8	0	70.0	68.3	68.6	69.0	83.6	65.6	86.6	78.6	5.0	7.6	3.2	5.3	4	23	3	21	0	0	9	15	0
July	2	10	3	4	10	28	28	8	0	72.2	73.0	73.2	72.8	81.6	63.7	86.2	77.2	2.8	7.3	1.8	4.0	10	19	2	19	0	0	24	14	0
Aug	9	39	5	8	9	11	2	10	0	73.7	72.6	72.1	72.8	90.4	65.0	86.7	80.7	2.5	6.5	2.4	3.8	7	23	1	20	0	0	23	5	0
Sept	10	38	13	0	5	12	6	6	0	73.4	71.2	72.5	72.4	90.4	71.0	88.8	83.4	4.2	7.3	3.2	4.9	7	19	4	15	0	0	10	1	0
Oct	23	42	9	3	0	1	3	12	0	66.3	66.2	67.3	66.6	83.0	63.4	87.6	78.0	3.2	5.8	2.1	3.7	14	16	1	13	0	0	5	0	0
Nov	32	20	7	5	5	7	6	8	0	58.6	61.8	58.8	59.7	86.4	71.0	84.3	80.6	5.5	6.5	5.1	5.7	7	14	9	11	0	0	0	2	0
Dec	21	14	15	5	9	9	8	11	1	57.3	58.5	58.6	58.1	84.9	64.4	87.7	79.0	5.6	5.5	3.4	4.8	8	18	5	10	0	0	0	0	0
Sums	115	237	101	103	79	200	94	148	21	758.1	756.5	758.6	757.8	1020.6	735.4	1013.4	923.2	48.7	70.5	32.2	50.5	131	191	44	149	0	4	87	55	0
	Percentages.																					Percentages.								
Means	10.5	21.6	9.2	9.4	7.2	18.2	8.6	13.5	1.9	63.2	63.0	63.2	63.1	85.0	61.3	84.4	76.9	4.1	5.9	2.7	4.2	35.8	52.2	12.0	40.7	0	1.1	23.8	15.0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.43 a. m., 2.43 p. m., and 10.43 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 7 a. m., May 19, inclusive, +.014 inch; from 11 a. m., May 19, to 11 p. m., December 31, 1884, inclusive, +.024 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—A small water-spout occurred over Lake Monroe on July 20; a gale of 64 miles per hour, north, occurred on October 15; the last frost of the season occurred on January 22; the first frost of the season occurred on December 3.

The office was moved from the Sanford House to the De Forest building between 11 p. m., July 31, and 7 a. m., August 1, 1884, changing the elevation of barometers 14 feet lower, thermometers 15.1 feet lower, and rain-gauge 6.6 feet lower.

J. H. MELTON,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAN FRANCISCO, CAL.

Location of office on December 31, 1884, Merchants' Exchange building, No. 431 California street.

[Latitude, 37° 48′ N.; longitude, 122° 26′ W. Elevation of barometer above sea-level, 60 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 68 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.080	30.090	30.060	30.077	30.477	1	29.541	28	.936	47.6	51.5	50.8	50.0	58.5	5, 14	43.0	24	15.5	54.7	46.6	8.94	1.44	29	28	SE.	5	SE.	4,498
Feb	29.948	29.988	29.952	29.963	30.350	22	29.374	15	.976	47.0	52.7	50.4	50.0	71.0	26	35.0	7	36.0	55.9	45.6	6.65	1.52	15, 16	31	W.	17	NE.	5,074
Mar	29.878	29.917	29.898	29.898	30.224	11	29.460	9	.764	51.6	56.5	53.8	54.0	68.5	2	45.0	25, 28	23.5	59.2	49.8	8.24	2.21	8, 9	36	SW.	9	W.	6,998
Apr	29.924	29.942	29.927	29.931	30.171	1	29.514	10	.657	51.9	58.8	54.3	55.0	68.5	8	45.0	27	23.5	61.2	50.7	6.33	1.66	11, 12	27	W.	15	W.	6,638
May	29.919	29.942	39.921	29.927	30.069	2	29.760	18	.309	54.3	63.2	57.0	58.2	80.0	7	49.0	6	31.0	65.3	53.4	.23	.12	25	28	W.	29	W.	7,256
June*	29.910	29.941	29.921	29.924	30.106	14	29.707	12	.399	55.9	63.2	58.0	59.0	71.0	29	52.5	6	18.5	65.2	55.3	2.57	1.23	11, 12	30	W.	27	W.	7,755
July	29.902	29.936	29.897	29.912	30.061	15	29.772	10	.289	55.7	65.5	58.8	60.0	83.0	10	52.0	6	31.0	67.7	55.0	(‖)	(‖)	......	36	W.	23	SW.	8,513
Aug	20.878	29.907	29.871	29.885	30.053	5, 28	29.753	11	.300	55.4	63.7	57.1	58.7	74.6	6	52.0	22	22.6	65.5	54.5	.04	.03	4	33	W.	29	SW.	8,351
Sept	29.900	29.933	29.896	29.910	30.109	15	29.640	30	.469	55.0	62.9	57.0	58.3	73.0	16	52.0	27	21.0	64.9	54.2	.33	.21	7, 8	30	W.	1	W.	7,200
Oct	29.984	29.958	29.988	29.942	30.142	21	29.730	1	.412	53.7	60.6	56.4	56.9	75.5	8	50.0	{1, 2, 3 24, 28}	25.5	64.0	52.5	2.55	1.15	12, 13	26	W., SE.	9, 12	SW.	4,922
Nov	30.013	30.028	30.010	30.017	30.219	24	29.740	20	.479	53.6	59.2	56.6	56.5	70.5	4	50.0	23	20.5	62.4	52.5	.26	.19	12	24	W.	2	NW.	4,091
Dec	29.904	29.908	29.893	29.902	30.225	31	29.488	25	.737	50.5	54.3	52.8	52.5	63.5	2	40.0	30	23.5	56.8	48.9	7.68	2.07	23, 24	45	N.	7	{SW., SE.}	7,266
Sums	359.190	359.490	359.179	359.288	....	....	....	..	6.777	632.2	712.1	663.0	669.1	......	......	.....	......	292.1	742.8	619.0	38.82	....	....	....	....	....	....	78,557
Means	29.932	29.958	29.932	29.941	30.477	†1	29.374	‡15	.565	52.7	59.3	55.2	55.7	83.0	§10	35.0	‡7	24.3	61.9	51.6	......	....	....	..	....	....	W.	......

* One 7 a. m. observation missed.

† January.

‡ February.

§ July.

‖ Inappreciable.

SAN FRANCISCO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	16	15	4	17	12	4	7	15	3	43.8	44.2	45.5	44.5	87.2	77.3	82.5	82.3	5.1	6.1	4.0	5.1	8	16	7	10	0	0	0	0	0
Feb	8	20	7	10	6	7	11	16	2	42.0	41.9	43.6	42.5	83.1	68.1	78.6	76.6	5.3	5.5	3.3	4.7	9	11	9	15	0	0	0	0	0
Mar	10	6	4	12	9	11	20	18	3	46.7	47.5	47.0	47.1	83.9	72.5	78.2	78.2	5.9	6.5	5.1	5.8	6	11	14	16	0	0	0	1	0
Apr	0	1	4	9	11	19	28	14	4	47.6	49.2	48.5	48.4	85.7	70.8	80.8	79.1	3.9	6.4	3.9	4.7	10	13	7	10	0	0	0	0	0
May	0	0	0	2	3	27	45	14	2	50.2	50.2	50.3	50.2	86.1	63.5	78.5	76.0	5.6	5.7	4.6	5.3	7	17	7	2	0	0	0	1	0
June* ..	2	0	0	6	3	33	40	3	2	52.5	52.9	52.4	52.6	88.2	69.6	81.8	79.9	6.6	5.7	5.7	6.0	8	7	14	7	0	0	0	0	0
July	0	0	0	0	2	48	34	4	5	52.2	53.1	52.6	52.6	88.1	65.4	80.3	77.9	5.7	2.2	3.7	3.9	14	12	5	0	0	0	0	0	0
Aug	0	0	0	1	0	54	37	0	1	52.9	54.1	53.5	53.5	91.5	71.4	87.9	83.6	7.6	2.5	6.2	5.4	4	20	7	1	0	0	0	0	0
Sept	1	1	0	2	4	28	43	6	5	51.7	52.8	51.8	52.1	89.1	70.4	83.4	81.0	3.3	1.9	2.1	2.4	20	7	3	3	0	0	0	0	0
Oct	6	5	1	10	2	26	18	21	4	51.2	52.9	51.9	52.0	91.5	76.5	85.5	84.5	5.1	2.9	2.7	3.6	13	14	4	4	0	0	0	0	0
Nov	4	11	4	10	5	16	11	23	6	50.6	50.5	50.5	50.5	89.8	73.7	80.7	81.0	4.2	4.7	2.1	3.7	15	12	3	2	0	0	0	0	0
Dec	14	10	5	18	9	18	4	12	3	43.2	42.4	44.9	43.5	77.9	66.7	76.5	73.7	5.7	5.4	5.1	5.4	10	8	13	13	0	0	0	1	0
Sums ..	61	69	29	97	66	291	298	146	40	584.6	591.7	592.5	589.5	1042.1	846.0	974.7	954.2	64.0	55.5	48.5	56.0	124	148	93	83	0	0	0	3	0
	Percentages.																					Percentages.								
Means .	5.6	6.3	2.6	8.8	6.0	26.5	27.2	13.3	3.6	48.7	49.3	49.4	49.1	86.8	70.5	81.2	79.5	5.3	4.6	4.0	4.6	34.0	40.5	25.5	22.7	0	0	0	0.8	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.58 a. m., 11.58 p. m., and 7.58 a. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .039.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—January, rainbows 3d and 27th; first killing frost of season, 11th; hail 27th; ice 15th and 17th; lightning 26th. February, hail 5th; sleet 6th; snow 6th and 7th. March, earthquake shocks 25th; hail 25th, 26th, 27th, and 28th; thunder-storm 25th; last frost 9th. April, lightning 24th; heavy rain-storm 11th. May, thunder-storm 17th; lightning 18th. June, large monthly rainfall, exceeding any previous record for June by over 1.50 inches. July, earthquake shock 15th. September, lightning 4th, 12th, 13th, and 14th. October, first light frost 2d; mirage 8th; lightning 12th and 16th. December, first killing frost 12th; severe norther 6th and 7th; thunder-storm 25th; lightning 24th; ice 12th, 13th, 29th, and 30th; heavy rain-storms 20th and 23d.

NELSON GOROM,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANTA FÉ, N. MEX.*

Location of office on December 31, 1884, No. 48 San Francisco Street.

[Latitude, 35° 41′ N.; longitude, 105° 57′ W. Elevation of barometer above sea-level, 7,026 feet. Elevation of exposed thermometer above ground, 84 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only.)									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan																												
Feb																												
Mar																												
Apr																												
May																												
June																												
July																												
Aug																												
Sept																												
Oct																												
Nov																												
Dec	23.153	23.138	23.168	23.153	23.506	1	22.800	27	.706	25.9	38.2	28.7	30.9	54.5	2	−2	31	56.5	41.6	21.4	1.77	.58	29, 30	27	N.	4	NE. SW.	4,497
Sums																												
Means																												

* Office re-established December 1, 1884.

SANTA FÉ, N. MEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan																														
Feb																														
Mar																														
Apr																														
May																														
June																														
July																														
Aug																														
Sept																														
Oct																														
Nov																														
Dec	13	21	4	8	14	21	10	2	0	18.5	20.9	19.7	19.7	74.0	55.1	69.6	66.2	5.0	5.7	4.4	5.0	11	10	10	13	5	28	0	0	0
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.04 a. m., 1.04 p. m., and 9.04 p. m., local time.
Correction for instrumental error of barometer used: From 5.04 a. m., December 1, to 9.04 p. m., December 31, 1884, inclusive, +.006 inch.
The barometric observations may be reduced to sea-level by adding the following constant for December, 6.930.

T. J. KENAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—**Continued.**

SAVANNAH, GA.

Location of office on December 31, 1884, corner Bay and Drayton streets.

[Latitude, 32° 5′ N.; longitude, 81° 5′ W. Elevation of barometer above sea-level, 87 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 56 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.[1]	30.145	30.097	30.152	30.131	30.532	27	29.530	8	1.002	41.6	52.6	45.5	46.6	68.5	31	18.5	6	50.0	55.2	38.3	3.89	2.43	7, 8	26	W.	9	NW.	5,589
Feb	30.049	30.014	30.044	30.036	30.351	16	29.584	28	.767	52.5	65.3	57.1	58.3	76.5	7	26.0	29	50.5	67.4	50.4	3.44	1.37	16, 17	26	W.	20	S.	5,285
Mar	30.008	29.964	30.004	29.992	30.374	16	29.636	28	.738	56.6	68.0	60.6	61.7	83.5	25	34.0	1	49.5	69.4	54.3	4.91	1.71	23	26	NW.	3	S.	6,349
Apr	29.892	29.831	29.873	29.865	30.082	27	29.446	2	.636	59.9	72.0	63.9	65.3	86.7	29	45.0	10	41.7	73.2	57.3	3.78	1.35	12	38	W.	2	W.	5,554
May	29.926	29.878	29.919	29.908	30.144	3	29.655	27	.489	72.1	83.3	73.0	76.1	90.5	12 20	58.0	31	32.5	84.1	68.3	1.22	.61	27, 28	23	N., NE., E.	27 29	S.	5,436
June[2]	29.956	29.925	29.952	29.944	30.149	16	29.656	11	.493	72.6	80.5	73.6	75.6	91.0	9	58.5	3	32.5	82.2	69.2	9.37	3.45	22, 23	28	NE.	15	S.	5,012
July	29.901	29.856	29.895	29.884	30.075	23	29.723	16	.352	79.3	87.8	80.1	82.4	96.0	6	68.5	8	27.5	89.7	75.9	3.68	1.38	1	18	E.	21	SW.	4,791
Aug.[3]	29.967	29.921	29.963	29.950	30.125	19	29.742	30	.383	75.4	84.2	76.6	78.7	92.5	4	69.0	12	23.5	85.9	72.9	8.41	1.80	22	[4]24	NE.	23	N., SE	[4]3,325
Sept.[5]	30.008	29.969	30.002	29.993	30.188	26	29.710	10	.478	72.2	82.1	74.9	76.4	88.2	18	60.5	15	27.7	83.0	70.3	4.55	2.16	10	24	E.	10	E.	4,332
Oct	30.071	30.017	30.050	30.046	30.349	20	29.827	9	.522	65.1	77.7	69.0	70.6	92.0	7	44.5	24	47.5	78.3	63.3	2.29	1.30	12	26	NE.	10	NE.	4,978
Nov	30.061	29.995	30.035	30.030	30.307	7	29.490	28	.817	52.3	66.8	56.9	58.7	75.7	4	37.0	25	38.7	67.6	50.0	1.72	.60	19	30	NW.	29	N.	4,826
Dec	30.107	30.047	30.088	30.081	30.406	27	29.696	6	.710	49.5	60.8	52.8	54.4	75.5	11	27.5	20	48.0	62.5	45.4	3.21	1.21	5, 6	25	SW., NW.	6, 18	N.	4,521
Sums	360.091	359.514	359.977	359.860	....	...	....	...	7.387	749.1	881.1	784.0	804.8	...	...	....	...	469.6	898.5	715.6	50.47	....	......	...	....	....	......	[6]59,998
Means	30.008	29.960	29.998	29.989	30.532	[7]27	29.446	[8]2	.616	62.4	73.4	65.3	67.0	96.0	[9]6	18.5	[7]6	39.1	74.9	59.6	....	....	......	...	....	....	S.	....

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[1] One 11 p. m. observation missed.
[2] Three 11 p. m. observations missed.
[3] Two 7 a. m., three 3 p. m., and three 11 p. m. observations missed.
[4] 27 days.
[5] Four 11 p. m. observations missed.
[6] For 362 days.
[7] January.
[8] April.
[9] July.

SAVANNAH, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	9	9	5	8	14	12	17	23	0	34.0	35.5	36.2	35.2	74.8	54.8	71.0	66.9	5.5	5.0	5.2	5.2	8	10	12	13	0	9	0	1	0
Feb	6	4	6	10	29	5	18	13	1	46.3	47.9	48.8	47.7	80.3	55.7	75.2	70.4	3.8	3.5	3.1	3.5	12	15	2	11	0	1	0	2	0
Mar	7	1	13	9	28	14	11	10	0	48.7	48.3	50.6	49.2	76.4	52.8	71.6	66.9	4.8	4.4	4.5	4.6	12	11	8	11	0	0	0	5	0
Apr	8	2	5	9	10	16	22	17	1	49.5	47.1	52.1	49.6	70.0	45.7	67.4	61.0	4.3	4.7	3.7	4.2	15	9	6	13	0	0	0	3	0
May	8	5	8	17	22	10	15	8	0	63.8	60.1	64.6	62.8	76.1	47.1	75.7	66.3	3.6	3.3	3.7	3.5	14	14	3	7	0	0	2	4	0
June	6	8	13	20	22	10	5	1	2	67.5	66.1	67.8	67.1	84.2	63.3	82.5	76.7	5.6	6.2	4.7	5.5	7	12	8	17	0	0	1	8	0
July	9	2	8	7	20	21	20	6	0	72.2	70.0	72.6	71.6	79.5	57.2	78.2	71.6	4.8	5.3	4.0	4.5	9	17	5	10	0	0	14	7	0
Aug	16	11	13	16	8	9	5	6	1	71.3	70.6	71.7	71.2	87.4	64.5	85.4	79.1	4.8	5.8	5.4	5.3	4	19	4	16	0	0	2	9	0
Sept	20	11	23	10	6	3	7	4	2	68.4	66.9	69.8	68.4	88.1	62.0	84.6	78.2	2.7	4.4	2.8	3.1	16	7	8	10	0	0	0	0	0
Oct	18	23	21	11	4	4	7	3	2	60.0	59.7	62.2	60.6	84.3	55.3	79.6	73.1	2.1	2.6	2.0	2.2	21	8	2	5	0	0	2	0	0
Nov	25	8	7	7	9	4	13	16	1	45.1	44.8	48.0	46.0	78.4	47.5	73.2	66.4	3.7	3.1	3.3	3.4	15	11	4	5	0	0	0	0	0
Dec	20	12	12	4	15	8	4	13	5	44.0	46.7	46.6	45.8	81.7	62.5	79.5	74.6	5.9	6.2	5.0	5.7	10	9	12	12	0	2	0	0	0
Sums	152	96	184	123	187	116	139	120	15	670.8	663.7	691.0	675.2	961.2	668.4	923.9	851.2	51.1	54.5	46.9	50.7	143	142	69	130	0	12	21	39	0
	Percentages.																					Percentages.								
Means	14.0	8.9	12.4	11.4	17.3	10.7	12.8	11.1	1.4	55.9	55.3	57.6	56.3	80.1	55.7	77.0	70.9	4.3	4.5	3.9	4.2	40.4	40.1	19.5	35.5	.0	3.3	5.9	10.7	.0

NOTE.—7 a m., 3 p. m., and 11 p. m., Washington time, correspond to 6.44 a. m., 2.44 p. m., and 10.44 p. m., local time.

Correction for instrumental error of barometer used: From 6.44 a. m., January 1, to 10.44 p. m., December 31, 1884, inclusive, —.000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.090; March, 0.090; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.090; December, 0.100.

REMARKS.—Light frost April 10, last of spring; light frost October 25, first of season; heavy frost December 3, first of season.

S. C. EMERY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SHAW, FORT, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 47° 31′ N.; longitude, 111° 48′ W. Elevation of barometer above sea-level, 3,550 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 24 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	26.423	26.411	26.409	26.414	26.802	1	25.994	26	.808	19.6	25.8	20.4	21.9	51.0	12	—15.0	4	66.0	30.1	11.5	.86	.28	3	48	SW.	12, 31	SW.	8,325
Feb	26.362	26.355	26.376	26.364	26.856	26	25.654	17	1.202	6.1	13.5	8.8	9.5	53.0	24	—32.0	11	85.0	19.0	—0.1	.82	.28	19, 20	44	SW.	1	SW.	6,032
Mar	26.284	26.271	26.277	26.277	26.581	20	25.892	10	.689	20.7	36.1	27.1	28.0	55.3	24	—22.5	7	77.8	39.8	18.5	.42	.12	9	40	SW.	8	SW.	5,472
Apr	26.380	26.352	26.360	26.364	26.748	18	25.951	13	.797	31.6	49.1	40.5	40.4	70.8	23	20.8	19	50.0	53.4	30.4	.59	.22	7	31	SW.	25	W.	5,301
May	26.406	26.371	26.374	26.384	26.686	29	26.046	3	.640	41.6	63.7	53.4	52.9	81.0	8	26.8	4	54.2	67.9	39.6	.74	.34	27, 28	39	NW.	9, 11	W.	5,529
June	26.367	26.330	26.335	26.344	26.653	30	26.173	26	.480	53.8	72.8	62.3	63.0	91.5	19	45.0	1	46.5	76.6	51.5	.97	.25	5, 6	35	SW.	24	W.	5,398
July	26.411	26.376	26.393	26.393	26.542	30	26.134	31	.408	52.0	71.4	61.4	61.6	85.0	5	37.8	5	47.2	75.5	50.4	2.66	.96	21, 22	44	SW.	31	W.	5,000
Aug	26.459	26.432	26.429	*26.440	26.655	2, 5	26.197	30	.458	52.0	76.3	68.6	64.0	92.0	10	36.5	20	55.5	79.4	49.3	.59	.49	14, 15	36	NW.	1	W.	4,658
Sept	26.318	26.283	26.308	26.303	26.592	19	26.004	27	.588	40.1	57.3	46.8	48.1	80.0	20	21.0	30	59.0	60.2	38.0	2.29	.76	14	42	W.	27	W.	6,322
Oct	26.326	26.317	26.340	26.328	26.713	16	25.969	1	.744	38.7	55.9	44.3	46.3	78.0	17	21.5	20	56.5	59.1	34.9	.39	.25	2	46	W.	25	W.	8,759
Nov	26.448	26.414	26.427	26.430	26.656	15	26.153	24	.503	32.3	47.6	37.3	39.1	67.0	7	— 8.5	22, 23	70.5	50.5	27.0	.84	.42	16	47	SW.	26	SW.	7,685
Dec	26.350	26.344	26.352	26.349	26.827	9	25.912	26	.915	—1.0	7.9	1.7	2.9	62.2	1	—44.5	24	106.7	11.1	—6.1	2.47	.46	6	40	SW.	3	W.	5,457
Sums ..	316.534	316.250	316.380	316.390	......	...	......	..	8.232	387.5	577.4	467.6	477.7	.....	...	......	.....	774.9	622.6	344.9	18.64	.....	......	...	......	......	......	74,538
Means .	26.378	26.355	26.365	26.366	26.856	†26	25.654	†17	.686	32.3	48.1	39.0	39.8	92.0	‡10	—44.5	§24	64.6	51.9	28.7	.....	.....	......	...	......	......	W.	......

* Mean of 20⅓ days. † February. ‡ August. § December.

SHAW, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p.m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	2	13	6	5	1	40	19	5	2	11.5	14.1	11.7	12.4	71.4	62.7	69.6	67.9	4.7	5.8	4.5	5.0	9	14	8	11	12	28	0	0	0
Feb	9	12	1	3	0	26	21	7	8	1.1	4.8	2.9	2.9	80.5	70.4	78.8	76.6	6.3	5.8	4.5	5.5	4	15	10	15	18	23	0	0	0
Mar	9	13	5	4	0	31	20	7	4	14.7	20.2	18.7	17.9	77.6	55.9	71.1	68.2	2.8	5.0	2.7	3.5	18	9	4	5	7	27	0	0	0
Apr	7	16	8	4	0	15	24	15	1	26.1	23.8	27.2	25.7	80.0	41.2	62.2	61.1	4.5	5.6	4.4	4.8	8	17	5	8	0	22	0	0	0
May	2	13	9	7	3	15	33	9	2	31.9	30.4	36.0	32.8	69.6	32.2	53.4	51.7	3.3	4.6	4.0	4.0	10	17	4	7	0	5	0	0	0
June	1	12	12	3	2	24	26	3	7	42.7	42.2	45.7	43.5	67.5	36.4	56.5	53.5	3.4	4.3	3.7	3.8	10	19	1	10	0	0	1	0	0
July	9	12	7	2	2	20	35	5	1	43.0	41.8	45.1	43.3	72.5	38.2	57.6	56.1	3.3	4.0	3.8	3.7	15	11	5	12	0	0	0	0	0
Aug	2	17	16	1	1	7	38	7	4	41.2	45.7	46.8	44.6	67.4	37.5	56.4	53.8	3.1	3.4	2.0	2.8	17	11	3	4	0	0	3	2	0
Sept	5	1	7	4	5	7	47	6	8	33.4	32.4	37.2	34.3	77.3	44.2	70.8	64.1	4.3	5.7	4.8	4.9	12	8	10	9	0	5	0	0	0
Oct	2	0	6	1	7	29	38	10	0	27.9	25.6	27.5	27.0	65.4	34.8	54.3	51.3	3.4	3.8	2.6	3.3	13	16	2	3	0	9	0	0	0
Nov	2	7	5	0	4	35	34	8	0	20.7	19.9	20.6	20.4	63.1	37.4	53.0	51.2	2.8	4.5	2.7	3.3	15	11	4	3	4	20	0	0	0
Dec	10	1	7	1	7	19	38	10	0	—10.2	— 5.6	— 7.1	— 7.6	66.5	59.1	69.2	64.9	3.3	5.6	5.2	4.7	12	11	8	15	22	27	0	0	0
Sums ..	60	117	89	35	32	268	373	87	37	284.0	295.3	312.3	297.2	858.8	549.5	752.9	720.4	45.2	58.1	44.9	49.3	143	159	64	102	63	166	4	2	0
	Percentages.																					Percentages.								
Means	5.5	10.7	8.1	3.2	2.9	24.4	33.9	7.9	3.4	23.7	24.6	26.0	24.8	71.6	45.8	62.7	60.0	3.8	4.8	3.7	4.1	39.1	43.4	17.5	27.9	17.2	45.4	1.1	0.5	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.41 a. m., 12.41 p. m., and 8.41 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 19, inclusive, +.030 inch; from 7 a. m., August 30, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.860; February, 3.850; March, 3.900; April, 3.670; May, 3.600; June, 3.570; July, 3.510; August, 3.530; September, 3.610; October, 3.700; November, 3.820; December, 3.830.

SAM'L W. MORRISON,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SILL, FORT, IND. T.

Location of office on December 31, 1884, post quarters.

[Latitude, 34° 40′ N.; longitude, 98° 30′ W. Elevation of barometer above sea-level, 1,200 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 6 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan																												
Feb																												
Mar																												
Apr																												
May																												
June																												
July	*28.710	*28.663	*28.665	*28.679	*28.829	21	*28.457	29	*.372	75.0	98.1	82.2	85.1	107.0	29	65.0	10	42.0	100.1	71.7	.23	.11	25	32	SW.	29	S.	7,618
Aug	28.801	28.738	28.749	28.763	28.985	4	28.566	19	.419	69.3	90.5	76.2	78.7	102.0	2	58.0	5	44.0	98.0	66.8	1.21	.39	19, 20	32	NE.	1	SE.	7,101
Sept	28.750	28.683	28.693	28.709	28.969	20	28.398	23	.571	68.0	88.6	76.1	77.6	99.0	1, 2	53.0	25, 26	46.0	90.7	66.5	2.24	.58	23	36	S.	30	SE.	8,206
Oct	28.915	28.840	28.863	28.873	29.170	23	28.643	11	.527	54.5	74.3	62.1	63.6	91.0	5, 6	39.5	28	51.5	76.6	53.5	5.01	3.65	20, 21	36	N.	8	S.	5,817
Nov	28.913	28.857	28.888	28.886	29.229	6	28.355	22	.874	40.1	57.8	46.8	48.2	74.5	8	25.0	23	49.5	60.8	39.0	2.61	.99	{10, 11 {16, 17	}38	N.	27	S.	5,419
Dec	28.837	28.769	28.820	28.809	29.326	31	28.222	4	1.104	25.9	36.9	30.1	31.0	66.0	8	2.0	25	64.0	41.1	23.5	2.71	1.97	10	42	N.	22	N.	7,608
Sums																												
Means																												

* Twenty-seven days.

SILL, FORT, IND. T.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan																														
Feb																														
Mar																														
Apr																														
May																														
June																														
July	9	5	3	25	27	6	3	0	15	67.7	61.2	64.4	64.4	78.5	30.7	56.6	55.3	4.2	2.7	.7	2.5	20	10	1	5	0	0	31	4	0
Aug	10	17	5	24	15	6	2	1	13	62.9	60.2	62.8	62.0	80.2	39.0	64.9	61.4	4.2	4.1	2.4	3.6	14	15	2	7	0	0	23	5	0
Sept	3	7	4	30	27	3	0	0	16	63.8	61.0	64.3	64.0	87.3	46.9	68.5	67.6	5.1	5.3	2.3	4.2	11	14	5	8	0	0	16	4	0
Oct	14	8	4	12	27	5	0	0	23	52.5	53.8	55.3	53.9	93.1	51.3	79.4	74.6	4.5	4.2	2.6	3.8	14	12	5	5	0	0	8	2	0
Nov	22	4	2	2	25	10	0	4	21	38.7	42.4	42.3	41.1	94.6	58.7	84.7	79.3	5.2	4.3	2.3	3.9	13	11	6	6	0	4	0	0	0
Dec	37	10	5	2	18	4	3	8	11	24.6	26.3	26.7	25.9	94.5	70.5	87.6	84.2	7.2	5.5	3.8	5.5	8	12	11	8	8	21	0	0	0
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.34 a. m., 1.34 p. m, and 9.34 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., July 1, to 11 p. m., July 10, inclusive, .00 inch; from 7 a. m., July 15, to 11 p. m., December 31, 1884, inclusive, —.028 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: July, 1.20; August, 1.18; September, 1.22; October, 1.26; November, 1.31; December, 1.33. Office records burned June 14.

J. H. DAVIS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SITKA, ALASKA.

Location of office on December 31, 1884, Castle Building, first floor.

[Latitude 57° 3′ N.; longitude, 135° 19′ W. Elevation of barometer above sea-level, 63 feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 43 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan……	29.801	29.788	29.767	29.785	30.385	13	28.941	7	1.444	37.8	39.9	38.7	38.8	49.8	3	19.0	27	30.8	43.8	34.2	14.01	4.59	14, 15	70	E.	10	E.	8,889
Feb……	30.034	30.049	30.037	30.040	30.584	27	29.046	23	1.538	29.3	34.1	31.7	31.7	52.5	28	11.0	16	41.5	37.8	25.8	6.15	3.45	23, 24	41	E.	22	E.	5,009
Mar ……	29.696	29.687	29.681	29.688	30.279	5	29.242	23	1.037	35.1	40.2	37.3	37.5	48.4	29	23.3	10	25.1	42.5	33.3	11.05	2.59	29, 30	45	E., SE.	13 28	E.	6,782
Apr……	29.895	29.879	29.867	29.880	30.431	7	29.392	28	1.069	40.3	48.2	45.9	44.8	60.1	23	27.5	17	32.6	51.7	37.7	2.76	1.12	4	56	SE.	4	E.	6,013
May ……	29.797	29.805	29.797	29.800	30.270	18	29.110	6	1.160	43.1	48.0	46.5	45.9	59.4	4	36.2	14	23.2	51.9	40.8	10.35	2.06	17	41	E.	15	E.	7,496
June……	29.781	29.798	29.788	29.789	30.118	29	29.293	17	.825	47.4	53.8	53.0	51.4	74.6	22	39.0	13	35.6	57.9	46.4	3.77	.98	17, 18	34	E.	17	SW.	5,154
July ……	29.993	29.992	29.989	29.992	30.255	11	29.715	26	.540	51.2	57.5	57.8	55.5	67.5	2	45.9	2	21.6	61.9	50.4	4.78	1.53	7, 8	34	NW.	18	W.	5,229
Aug ……	29.834	29.831	29.830	29.832	30.058	1	29.443	31	.615	53.6	60.1	58.5	57.4	71.8	21	44.4	14	27.4	63.4	52.1	6.91	1.39	28	30	SE.	28	W.	4,556
Sept ……	29.786	29.798	29.802	29.795	30.193	5	29.316	26	.877	46.9	52.6	50.1	49.9	65.7	4	32.0	30	33.7	57.0	43.9	13.20	1.61	26, 27	28	NW. E.	3 25 26	SW.	4,710
Oct ……	29.615	29.606	29.607	29.609	30.228	21	29.006	10	1.222	41.2	44.8	42.1	42.7	55.1	3	26.0	18	29.1	48.1	37.2	14.56	2.11	2, 3	40	S.	14	SE.	7,516
Nov ……	29.621	29.612	29.622	29.618	30.101	20	28.903	30	1.198	42.5	43.9	42.8	43.1	55.8	29	27.0	21	28.8	47.4	38.0	16.31	2.69	11, 12	52	S.	29	E.	8,589
Dec……	29.927	29.940	29.932	29.933	30.336	15	28.901	2	1.435	31.6	33.1	31.5	32.1	56.3	1	14.6	20	41.7	37.8	26.9	7.09	2.31	7	52	SE.	1	NE.	6,838
Sums ..	357.780	357.785	357.719	357.761	……	…	……	…	13.010	500.0	556.2	535.9	530.8	……	…	……	…	371.1	601.2	466.7	110.94	……	……	…	……	…	……	76,781
Means .	29.815	29.815	29.810	29.813	30.584	*22	28.901	†2	1.084	41.7	46.4	44.7	44.2	74.6	‡22	11.0	*16	30.9	50.1	38.9	……	……	……	…	……	…	E.	……

* February. † December. ‡ June.

SITKA, ALASKA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.
1884.										°	°	°	°																	
Jan	0	10	64	6	1	0	3	6	3	29.5	31.8	31.0	30.6	73.2	73.0	74.4	73.5	7.4	7.8	7.2	7.5	5	3	23	16	0	8	0	0	1
Feb	0	23	39	7	0	3	1	4	10	22.3	26.7	23.8	24.3	75.0	74.5	72.3	73.9	4.1	4.2	3.7	4.0	14	8	7	7	5	21	0	0	2
Mar	0	16	44	9	4	2	0	4	14	28.2	33.2	30.0	30.1	76.9	74.9	75.9	76.6	7.2	7.1	7.0	7.1	6	6	19	19	0	10	0	0	0
Apr	0	16	24	8	0	11	12	10	9	29.9	34.5	34.6	33.0	68.3	61.7	66.6	65.5	4.9	4.2	5.1	4.7	11	10	9	11	0	2	0	0	1
May	0	0	46	7	3	9	7	15	6	37.5	38.8	39.0	38.4	80.7	72.1	75.8	76.2	9.1	8.4	8.0	8.5	0	8	23	26	0	0	0	0	0
June	0	1	22	4	1	27	17	9	9	42.3	45.6	45.3	44.4	82.9	75.0	76.3	78.1	8.1	8.0	7.3	7.8	4	6	20	14	0	0	0	0	0
July	0	5	3	2	0	16	46	17	4	45.6	50.7	50.9	49.1	81.5	78.7	78.4	79.5	7.6	7.7	7.3	7.5	4	6	21	8	0	0	0	0	1
Aug	0	1	21	9	0	13	24	15	10	49.0	50.9	51.6	50.5	84.9	73.7	79.3	79.3	8.3	6.9	8.1	7.8	4	7	20	12	0	0	0	0	3
Sept	1	15	20	6	6	23	6	1	12	43.0	45.9	44.5	44.5	86.5	78.4	82.1	82.3	6.3	6.3	5.3	6.0	9	7	14	18	0	0	0	0	4
Oct	2	16	18	20	1	6	5	14	11	35.6	36.6	35.3	35.8	80.8	73.5	77.7	77.3	8.4	8.0	8.6	8.3	3	3	25	26	0	2	0	0	0
Nov	6	2	55	8	1	3	0	3	12	37.0	38.0	37.3	37.4	81.4	80.1	81.4	81.0	8.0	8.2	6.9	7.7	3	7	20	23	0	4	0	0	0
Dec	0	30	10	8	4	3	1	7	30	24.3	25.7	25.1	25.0	74.4	74.2	76.6	75.1	4.2	4.4	4.1	4.2	16	4	11	10	8	22	0	0	4
Sums	9	135	366	94	21	116	122	105	130	424.2	456.9	448.4	443.1	945.5	889.8	916.8	917.3	83.6	81.2	78.6	81.1	79	75	212	190	13	69	0	0	16
	Percentages.																					Percentages.								
Means	.8	12.3	33.3	8.6	1.9	10.6	11.1	9.6	11.8	35.4	38.1	37.4	37.0	78.8	74.2	76.4	76.5	7.0	6.8	6.6	6.8	21.6	20.5	57.9	51.9	3.6	18.9	0	0	4.4

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.07 a. m., 11.07 a. m., and 7.07 p. m., local time.

Correction for instrumental error of barometer used: From 3.07 a. m., January 1, to 7.07 p. m., December 31, 1884, inclusive, +.003 inch.

Barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October 0.070; November, 0.070; December, 0.070.

JOHN J. McLEAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SMITHVILLE, N. C.

Location of office on December 31, 1884, Central Building, Fort Johnston.

[Latitude, 33° 55′ N.; longitude, 78° 1′ W. Elevation of barometer above sea-level, 34 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.169	30.125	30.172	30.155	30.679	27	29.428	8	1.251	39.8	47.3	42.4	43.2	63.5	24	6.0	6	57.5	51.3	34.5	3.44	.84	8	49	SE.	8	W.	7,279
Feb	30.084	30.056	30.095	30.078	30.500	16	29.490	28	1.010	51.5	59.3	53.7	54.8	69.0	8	25.5	29	43.5	62.3	48.0	2.88	.80	17	41	S.	19	SW.	7,613
Mar.	30.038	29.908	30.042	30.026	30.404	4	29.573	29	.831	52.5	60.5	55.6	56.2	75.0	29	27.4	4	47.6	62.9	49.9	2.80	.92	13	41	SW.	8	SW.	8,857
Apr.	29.904	29.851	29.894	29.887	30.184	12	29.320	2	.864	55.5	64.8	58.0	59.4	85.6	29	38.5	10	47.1	66.6	51.5	2.37	1.12	21, 22	32	S.	15	NW., SW.	7,650
May	29.969	29.940	29.965	29.958	30.223	3	29.711	11	.512	68.8	76.0	69.6	71.5	83.2	25	52.6	30	30.6	77.7	64.4	1.42	.72	27	27	W.	9	SW.	7,679
June.....	30.035	30.009	30.025	30.023	30.258	16	29.756	11	.502	71.0	78.9	72.4	74.1	86.0	26	50.6	3	35.4	80.5	66.6	2.31	.79	27	31	S	11	S.	7,761
July.....	29.929	29.895	29.922	29.915	30.123	23	29.741	16	.382	78.2	84.2	78.5	80.3	88.8	14	66.0	8	22.8	85.6	74.0	7.32	6.19	10, 11	40	SW.	29	SW.	9,210
Aug	30.005	29.968	30.014	30.002	30.180	20	29.773	31	.407	73.9	81.1	76.3	77.1	88.0	1	64.8	14	23.2	82.6	71.0	5.88	1.05	7, 8	26	SW.	4	NE.	6,705
Sept	30.094	30.070	30.101	30.088	30.251	26	29.840	17	.411	72.4	79.8	75.4	75.9	84.5	17	59.4	15	25.1	81.2	68.9	3.11	2.09	12, 13	32	SE.	12	SE.	7,278
Oct	30.146	30.099	30.128	30.124	30.493	20	29.873	30	.620	64.2	73.2	66.6	68.0	86.5	6	36.9	24	49.6	74.5	59.7	.28	.21	30	24	NE.	27	E.	5,993
Nov.	30.102	30.054	30.089	30.082	30.380	6, 7	29.553	28	.827	50.1	62.1	54.2	55.5	71.2	4	32.3	25	38.9	63.8	45.7	1.81	1.12	27, 28	34	SW.	28, 29	N.	5,518
Dec	30.176	30.125	30.163	30.155	30.498	27	29.771	18	.727	45.7	53.9	48.4	49.3	69.9	8	15.9	20	54.0	56.1	40.1	2.93	.97	14, 15	48	SE.	15	N.	7,216
Sums ..	360.651	360.210	360.610	360.489	......	...	......	...	8.344	723.6	821.1	751.1	765.3	..	...	...	...	475.3	845.4	674.8	36.00	....	......	...	....	.....	....	88,759
Means .	30.054	30.018	30.051	30.041	30.679	*27	29.320	†2	.695	60.3	68.4	62.6	63.8	88.8	‡14	6.0	*6	39.6	70.4	56.2	.....	....	......	...	....	.....	SW.	......

*January. †April. ‡July.

SMITHVILLE, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	18	15	2	1	6	15	23	13	0	35.8	37.0	36.7	36.5	85.5	69.1	81.0	78.5	6.4	5.5	4.3	5.4	8	14	9	12	1	12	0	0	0
Feb	6	13	10	2	12	24	12	8	0	47.9	49.5	49.4	48.9	87.9	71.6	86.2	81.9	5.5	4.2	3.6	4.4	12	9	8	13	0	1	0	3	2
Mar	9	5	10	7	15	20	15	11	1	47.1	47.8	49.0	48.0	83.1	67.9	79.9	77.0	5.4	6.3	4.3	5.3	8	13	10	13	0	2	0	6	0
Apr	14	7	9	5	11	16	12	16	0	48.1	50.5	51.3	50.0	77.7	63.3	80.7	73.9	4.7	4.9	3.5	4.4	9	16	5	13	0	0	0	1	0
May	5	11	20	4	14	23	13	3	0	63.5	64.8	65.4	64.6	83.8	69.2	86.9	80.0	4.2	3.2	2.2	3.2	15	13	3	6	0	0	0	5	0
June.....	8	13	12	9	26	14	5	1	2	65.8	69.0	68.1	67.6	83.8	72.3	86.8	81.0	4.9	4.8	4.3	4.7	11	12	7	11	0	0	0	3	0
July.....	5	3	4	4	14	46	13	3	1	72.5	74.0	74.0	73.5	83.2	72.4	86.7	80.8	4.4	4.2	3.7	4.1	11	17	3	13	0	0	0	5	0
Aug	8	26	10	8	14	18	3	4	2	71.8	74.0	73.2	73.0	93.6	79.2	90.5	87.8	5.5	5.7	4.3	5.2	9	15	7	14	0	0	0	4	0
Sept	4	20	20	23	8	11	2	2	0	69.0	70.8	70.6	70.1	89.3	74.7	85.7	83.2	2.9	2.9	1.7	2.5	20	7	3	4	0	0	0	0	0
Oct	19	20	22	6	5	9	7	5	0	58.4	60.8	60.2	59.8	82.1	66.4	80.7	76.4	3.1	2.1	1.8	2.3	23	5	3	3	0	0	0	1	0
Nov	23	20	4	3	6	10	14	10	0	44.0	49.5	48.4	47.3	80.2	65.6	81.5	75.8	4.0	4.0	2.2	3,4	14	13	3	8	0	0	0	0	0
Dec	25	22	6	2	6	10	14	6	2	39.9	45.1	44.8	43.3	80.8	74.7	87.6	81.0	5.5	5.9	4.9	5.4	10	10	11	15	1	6	0	3	0
Sums ..	144	175	129	74	137	216	133	82	8	663.8	692.8	691.1	682.6	1011.0	846.4	1014.2	957.3	56.5	53.7	40.8	50.3	150	144	72	125	2	21	0	31	2
	Percentages.																					Percentages.								
Means .	13.1	15.9	11.8	6.7	12.5	19.7	12.1	7.5	0.7	55.3	57.7	57.6	56.9	84.2	70.5	84.5	79.7	4.7	4.5	3.4	4.2	41.0	39.3	19.7	34.2	0.5	5.7	0	8.5	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time.

Corrections for instrumental error of barometer used: From 6.56 a. m., January 1, to 10.56 p. m., August 31, inclusive, +.022 inch. From 6.56 a. m., September 1, to 10.56 p. m., December 31, 1884, +.013.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.030; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

F. P. CHAFFEE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SPOKANE FALLS, WASH.

Location of office on December 31, 1884, Brown's Block.

[Latitude, 47° 39′ N.; longitude, 117° 24′ W. Elevation of barometer above sea-level, 1,909 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 40 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan.[1]	28.135	28.153	28.134	28.141	28.620	1	27.554	27	1.066	19.8	27.7	25.8	24.4	50.9	6	1.2	21	49.7	32.6	17.5	1.79	1.44	4	22	NW., SW.	8, 12	N.	1,906
Feb	27.967	27.973	27.961	27.967	28.530	26	27.110	17	1.420	16.4	24.5	23.1	21.3	48.8	23	—17.8	12	66.6	30.2	12.7	3.04	1.11	19, 20	29	SW.	22	NE.	1,894
Mar	27.860	27.855	27.824	27.846	28.205	13	27.190	9	1.015	29.3	40.6	37.8	35.9	58.2	31	12.0	6	46.2	46.4	27.8	1.54	.79	9, 10	22	SW.	11	SW.	2,369
Apr	27.885	27.870	27.844	27.866	28.185	4	27.502	12	.683	41.1	58.2	51.2	50.2	73.0	9	31.5	4	41.5	62.2	39.0	1.33	.32	15, 16	22	SW.	24	SW.	2,845
May	27.929	27.917	27.874	27.907	28.200	29	27.607	20	.593	47.3	70.0	62.2	59.8	88.8	31	37.8	1	51.0	74.5	46.0	.56	.37	10	21	SW.	3	SW.	2,978
June	27.878	27.866	27.838	27.861	28.126	17	27.589	13	.537	56.0	72.5	68.7	65.7	93.8	18	42.8	27	51.0	78.7	53.9	2.58	.57	13, 14	26	SW.	22	SW.	3,068
July	27.934	27.930	27.899	27.921	28.153	8	27.702	6	.451	55.0	73.5	68.6	65.7	91.0	25	42.8	17	48.2	79.2	53.6	1.06	.45	17, 18	19	SW.	7	SW.	3,587
Aug	27.985	27.945	27.898	27.943	28.240	29	27.730	26	.510	55.4	79.9	73.4	69.6	97.5	5	44.8	17	53.2	85.1	53.9	.54	.54	14	16	SW.	13, 31	SW.	2,895
Sept	27.940	27.920	27.889	27.916	28.176	26	27.640	30	.536	43.6	59.7	54.1	52.5	75.3	20	32.8	26	42.5	63.1	42.6	2.43	1.12	3, 4	19	SW.	1	SW.	3,289
Oct	28.000	27.993	27.975	27.989	28.435	16	27.590	1, 12	.845	39.3	53.3	48.1	46.9	70.5	8	26.0	7	44.5	57.2	37.9	1.82	.54	18	17	SW.	8	SW.	2,675
Nov	28.124	28.120	28.099	28.114	28.395	27	27.837	20	.558	33.2	41.8	38.2	37.7	56.2	6	18.0	22	38.2	46.0	32.1	.59	.19	3, 4	[2]16	NW.	26	NE.	[2]1,304
Dec	28.005	27.981	27.985	27.990	28.541	9	27.309	19	1.232	10.9	19.3	16.2	15.5	44.3	3	—17.8	31	62.1	23.5	8.5	3.28	.73	18, 19	23	W.	5	W.	1,874
Sums ..	335.642	335.523	335.220	335.461	.....	...	....	...	9.446	447.3	621.0	567.4	545.2	....	...	......	...	594.7	678.7	425.5	20.56	....	....	...	....	....	....	[3]30,684
Means .	27.970	27.960	27.935	27.955	28.620	[4]1	27.110	[5]17	.787	37.3	51.8	47.3	45.5	97.5	[6]5	—17.8	[5]12 [7]31	49.6	56.6	35.5	.....	....	......	..	....	.....	SW.	....

[1] Three 7 a. m., five 3 p. m., and five 11 p. m. observations missed. [2] For 28 days. [3] For 364 days. [4] January. [5] February. [6] August. [7] December.

SPOKANE FALLS, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	22	9	6	0	4	8	11	7	26	14.0	22.7	21.1	19.3	77.7	81.5	82.0	80.4	4.6	4.6	2.1	3.8	12	9	5	7	14	25	0	0	0
Feb......	7	13	10	2	2	9	4	10	30	11.7	16.9	17.8	15.5	81.1	73.0	80.2	78.1	5.5	6.8	4.9	5.7	7	10	12	14	16	27	0	0	0
Mar......	5	9	11	1	3	14	9	6	35	25.6	31.2	32.1	29.6	85.8	70.2	80.6	78.9	3.6	5.7	4.1	4.5	11	18	7	8	2	24	0	0	0
Apr......	10	9	12	6	9	20	4	2	18	36.0	39.7	41.7	39.1	82.8	53.2	71.6	69.2	4.4	5.6	3.0	4.3	12	11	7	12	0	1	0	1	0
May	5	6	5	1	6	24	8	6	32	40.1	41.8	47.4	43.1	76.8	38.3	59.7	58.3	3.1	4.6	3.3	3.7	14	12	5	7	0	0	0	3	0
June.....	9	5	6	10	12	21	5	4	18	49.2	50.2	51.4	50.3	78.3	48.4	55.5	60.7	4.5	5.8	5.7	5.3	6	16	8	12	0	0	2	4	0
July.....	7	10	3	6	9	29	5	6	18	47.6	49.0	50.2	48.9	76.9	43.8	53.6	58.1	4.6	6.5	5.5	5.5	6	15	10	11	0	0	1	0	0
Aug	10	7	5	3	4	33	1	4	26	45.5	49.9	49.7	48.4	69.5	37.1	44.6	50.4	1.2	2.2	1.8	1.7	23	7	1	1	0	0	7	1	0
Sept	6	10	5	4	4	35	3	5	18	34.2	40.0	40.2	38.1	70.6	50.1	61.1	60.6	5.2	6.8	4.4	5.4	6	18	6	15	0	0	0	0	2
Oct	4	12	5	1	8	28	4	6	25	35.6	38.3	39.1	37.7	86.6	59.2	71.9	72.6	5.3	6.1	4.6	5.3	10	9	12	18	0	5	0	1	0
Nov	13	26	7	1	1	7	2	11	22	30.6	35.4	33.7	33.2	90.1	78.7	84.1	84.3	6.3	7.3	4.3	6.0	4	18	8	9	0	11	0	0	0
Dec.....	2	29	5	7	3	15	22	10	10	7.7	13.4	11.3	10.8	86.7	78.6	81.0	82.1	7.8	7.1	6.7	7.2	2	13	16	19	23	30	0	0	0
Sums ..	100	135	80	42	65	243	78	77	278	377.8	428.5	435.7	414.0	962.9	712.1	825.9	833.7	56.1	69.1	50.4	58.4	113	151	97	128	*55	*123	10	10	2
	Percentages																					Percentages.								
Means	9.1	12.3	7.3	3.8	5.9	22.1	7.1	7.0	25.3	31.5	35.7	36.3	34.5	80.2	59.3	68.8	69.4	4.7	5.8	4.2	4.9	31.3	41.8	26.9	35.0	*15.3	*34.3	2.7	2.7	0.5

* For 359 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.19 a. m., 12.19 p. m., and 8.19 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., November 28, inclusive, +.005 inch; from 11 p. m., November 30 to 11 p. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.14; February, 2.13; March, 2.13; April, 2.06; May, 2.05; June, 2.04; July, 1.98; August, 2.00; September, 2.04; October, 2.08; November, 2.08; December, 2.13.

REMARKS.—Office moved November 30. First observation in new office 11 p. m., November 30. Old office destroyed by fire November 29. Elevation of instruments from January 1 to November 28, inclusive, as follows: Barometer above mean tide-level, 1,906 feet; thermometer above ground, 22.08 feet; rain-gauge above ground, 32.48 feet. Station barometer No. 135 broken by fire November 29, and No. 1857 adopted as station barometer. Unusually heavy snow-storms from December 17 to December 28, impeding travel on railroads. No trains between here and Portland, Oreg., during that time.

D. MOORE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SPRINGFIELD, ILL.

Location of office on December 31, 1884, corner Sixth and Monroe streets.

[Latitude, 39° 48′ N.; longitude, 89° 39′ W. Elevation of barometer above sea-level, 644 feet. Elevation of exposed thermometer above ground, 39 feet. Elevation of rain-gauge above ground, 61 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan ...	29.511	29.495	29.521	29.509	30.005	5	29.002	10	1.003	18.2	24.3	20.0	20.8	62.5	30	—22.3	5	84.8	29.6	12.8	1.61	.62	18, 19	29	W.	30	S.	6,678
Feb	29.359	29.327	29.355	29.317	29.765	15	28.791	19	.974	29.6	35.2	31.4	32.1	55.1	2	5.6	14	49.5	41.2	24.4	4.24	1.14	12	34	NW.	19	NW.	7,403
Mar	29.327	29.301	29.328	29.319	29.721	4	28.716	1	1.005	35.2	45.0	39.8	40.0	66.5	27	7.0	3	59.5	48.0	32.4	3.70	.99	25	33	W.	25	S.	7,904
Apr	29.277	29.256	29.267	29.267	29.528	20	28.720	1	.808	47.2	57.0	51.2	51.8	80.0	30	32.2	8	47.8	59.8	44.0	2.49	.81	19, 20	32	S., W.	14, 27	NE., S., W.	7,806
May	29.301	29.281	29.291	29.291	29.652	29	28.954	18	.698	56.8	69.1	60.7	62.2	78.1	21	41.0	29	37.1	71.0	52.7	3.79	1.07	5, 6	24	W., NW.	5, 19	S.	5,415
June	29.355	29.316	29.334	29.335	29.548	28	28.983	9	.565	66.3	77.8	69.7	71.3	90.8	22	50.9	10	39.9	80.1	62.8	6.20	1.96	13	29	NW.	8	S.	4,248
July	29.277	29.257	29.264	29.266	29.504	20	29.059	4	.445	69.6	80.4	73.0	74.3	90.3	22	61.2	7	29.1	83.1	66.7	3.62	.84	24, 25	30	NW.	26	NW.	4,840
Aug	29.400	29.368	29.377	29.382	29.608	9	29.078	28	.590	65.4	79.5	70.2	71.7	91.1	19, 20	48.9	9	42.2	81.6	63.7	1.54	1.16	27, 28	24	NW.	8	S.	5,032
Sept	29.392	29.350	29.359	29.367	29.654	13	28.970	23	.684	64.2	78.8	69.5	70.8	91.1	9	50.9	21	40.2	80.7	62.8	6.86	2.88	26, 27	29	W.	28	S.	5,7[illegible]0
Oct	29.501	29.452	29.469	29.474	29.799	15	29.188	7	.611	53.9	67.1	58.1	59.7	86.0	2	34.9	23	51.1	69.8	51.1	2.74	.93	21	20	SW., NW.	5, 22, 24	S.	5,097
Nov	29.443	29.413	29.430	29.429	29.860	6	28.856	22	1.004	39.9	49.8	42.8	44.2	66.9	9	13.6	24	53.3	53.6	36.2	1.80	.51	22, 23	36	NW.	23	NW.	5,874
Dec	29.436	29.430	29.445	29.444	29.967	19	28.684	6	1.283	27.4	31.6	28.3	29.1	60.0	5	— 8.8	19	68.8	36.8	22.4	5.19	1.50	27, 28	32	W.	31	S.	7,066
Sums ..	352.599	352.246	352.440	352.430	......	...	......	...	9.670	578.7	695.6	614.7	628.0	...	...	...	..	603.3	735.8	532.0	43.18	...	......	...	....	......	....	72,148
Means .	29.383	29.354	29.370	29.369	30.005	*5	28.684	†6	.806	47.8	58.0	51.2	52.3	91.1	‡19 ‡20 §9	—22.3	*5	50.3	61.3	44.3	......	.....	......	...	....	......	S.	......

* January. † December. ‡ August. § September.

SPRINGFIELD, ILL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	14	7	1	3	22	13	15	15	3	13.6	12.1	14.1	13.3	81.7	60.3	77.1	73.0	4.7	4.9	4.4	4.7	11	14	6	11	16	27	0	0	0
Feb	6	11	6	8	17	6	7	26	0	24.7	24.4	25.4	24.8	81.3	65.6	78.3	75.1	6.4	7.2	5.6	6.4	4	11	14	13	2	21	0	0	0
Mar	11	10	10	12	16	5	13	15	1	29.3	31.5	31.5	30.8	78.8	61.0	72.4	70.7	4.4	6.2	5.4	5.3	10	10	11	15	9	14	0	3	0
Apr	9	15	8	13	15	1	15	14	0	38.0	36.5	40.3	38.3	71.5	49.7	67.5	62.9	6.5	6.1	6.2	6.3	7	11	12	14	0	0	0	1	0
May	14	9	6	6	17	13	15	9	4	48.5	49.1	50.2	49.3	74.9	51.4	68.7	65.0	4.7	5.5	3.3	4.5	12	12	7	11	0	0	0	4	0
June	5	10	14	15	18	11	1	4	12	60.6	63.2	62.9	62.2	82.1	62.9	79.7	74.9	6.4	7.1	5.3	6.3	5	13	12	12	0	0	2	8	0
July	13	7	4	16	9	10	12	17	5	62.1	62.8	63.6	62.8	76.7	57.5	73.2	69.1	5.1	6.3	3.7	5.0	7	19	5	16	0	0	2	9	0
Aug	11	10	8	10	19	10	10	12	3	58.4	57.3	59.9	58.5	78.5	49.1	70.7	66.1	3.0	5.6	2.3	3.6	13	17	1	8	0	0	2	3	0
Sept	6	4	7	6	38	15	5	9	0	58.2	59.0	59.9	59.0	81.2	52.7	72.5	68.8	4.3	4.3	3.6	4.1	11	14	5	12	0	0	2	4	0
Oct	6	7	3	7	31	17	7	14	1	47.4	50.0	48.4	48.6	78.8	56.1	70.0	68.3	3.3	4.5	3.2	3.7	14	13	4	8	0	0	0	1	0
Nov	11	8	2	2	17	17	5	25	3	32.2	35.8	33.9	34.0	74.2	60.4	72.2	68.9	4.4	5.1	4.0	4.5	13	9	8	7	0	9	0	0	0
Dec	12	8	3	8	25	4	10	18	5	21.3	23.4	22.6	22.4	77.5	72.3	79.3	76.4	7.2	8.2	6.9	7.4	5	7	19	15	11	18	0	0	0
Sums	118	106	72	106	244	122	115	178	37	494.3	505.1	512.7	504.0	937.2	699.0	881.6	839.2	60.4	71.0	53.9	61.8	112	150	104	142	38	89	8	33	0
	Percentages.																					Percentages.								
Means	10.7	9.7	6.6	9.7	22.2	11.1	10.5	16.2	3.4	41.2	42.1	42.7	42.0	78.1	58.2	73.5	69.9	5.0	5.9	4.5	5.2	30.6	41.0	28.4	38.8	10.4	24.3	2.2	9.0	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.10 a. m., 2.10 p. m., and 10.10 p. m., local time.

Corrections for instrumental error of barometer used: From 6.10 a. m., January 1, to 10.10 p. m., August 31, inclusive, +.018 inch; from 6.10 a. m., September 1, to 10.10 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.730; February, 0.730; March, 0.720; April, 0.700; May, 0.670; June, 0.670; July, 0.660; August, 0.660; September, 0.670; October, 0.690; November, 0.720; December, 0.730.

REMARKS.—Barometer No. 440, instrumental error −.008, substituted for No. 396, instrumental error −.013, at 6.10 a. m. (local time), September 1; January 5, temperature −22.3, coldest since opening of station. Last snow, April 22; first light frost, October 10; first killing frost, October 23; first snow, November 17.

WILLIAM NORRINGTON,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

STOCKTON, FORT, TEX.

Location of office on December 31, 1884, south corner of Plaza, half a mile from Fort Stockton.

[Latitude, 30° 53′ N.; longitude, 102° 53′ W. Elevation of barometer above sea-level, 3,010 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	27.149	27.117	27.140	27.134	27.505	1	26.763	6	.742	30.6	51.2	37.5	39.8	78.5	29	8.7	5	69.8	54.1	26.5	.21	.07	15, 16	36	S.	26	SW.	4,639
Feb	26.991	26.965	26.989	26.983	27.302	22	26.664	18	.638	42.5	63.9	49.0	51.8	82.0	25	23.0	14	59.0	67.2	39.4	.88	.82	6	40	W.	16	SE.	5,139
Mar	26.935	26.906	26.928	26.923	27.217	14	26.662	10	.555	47.5	71.2	56.8	58.5	89.5	10	27.0	1	62.5	74.4	45.3	.12	.05	12	40	NW., SW.	27, 31	SE.	7,591
Apr	26.934	26.914	26.912	26.920	27.217	21	26.656	28	.561	48.1	72.0	58.4	59.5	90.4	25	29.4	21	61.0	76.2	46.4	.91	.47	2, 3	37	SE.	30	SE.	7,020
May	26.944	26.931	26.933	26.936	27.242	8	26.755	21	.487	57.2	81.3	67.7	68.7	95.4	29	42.0	1	53.4	84.9	55.7	1.66	.45	2, 3	39	SE.	19	SE.	8,179
June	26.976	26.951	26.958	26.963	27.093	27	26.752	6	.341	66.8	89.5	77.0	77.8	101.1	25	55.8	19	45.3	92.2	65.9	2.84	.69	2	32	SE., NW.	6, 20	SE.	6,661
July	26.965	26.935	26.939	26.946	27.060	20	26.848	16	.212	72.6	98.7	84.1	85.1	107.4	12	66.2	1	41.2	101.0	71.7	.52	.24	24, 25	30	S.	24	SE.	7,699
Aug	27.028	26.995	27.004	27.009	27.141	4	26.875	1	.266	69.1	90.3	78.4	79.3	104.9	2	62.1	31	42.8	93.7	68.0	2.75	1.40	18, 19	31	SE.	2	SE.	7,146
Sept	26.978	26.956	26.972	26.969	27.174	20	26.794	29	.380	66.4	85.8	73.1	75.1	95.2	6, 7	57.0	28	38.2	87.4	65.5	5.84	2.64	7, 8	30	NW., W.	5, 7	SE.	5,453
Oct	27.076	27.047	27.071	27.065	27.293	16	26.820	1	.473	56.0	73.8	62.5	63.9	87.8	5	40.3	28	47.5	75.7	54.7	6.25	1.75	24, 25	36	SE.	1	SE.	6,859
Nov	27.091	27.075	27.099	27.088	27.374	6	26.707	21	.667	44.6	62.9	50.2	52.6	80.7	1	30.2	30	50.5	61.5	42.6	.82	.67	10	30	W., N.	22, 27	SE.	4,524
Dec	26.967	26.942	26.977	26.962	27.416	31	26.645	27	.771	38.1	55.2	42.4	45.2	80.0	23	13.8	25	66.2	58.8	33.9	1.27	.70	10, 11	44	NW.	4	SW.	4,987
Sums	324.037	323.733	323.922	323.898	......	..	......	..	6.093	639.5	895.8	737.1	757.3	.....	...	.....		637.4	930.1	616.2	24.07	.....	.....	...	....	.....	.....	75,897
Means	27.003	26.978	26.994	26.992	27.505	*1	26.645	†27	.508	53.3	74.6	61.4	63.1	107.4	‡12	8.7	§5	53.1	77.5	51.4	.....	.....	.....	...	....	.....	SE.	......

* January. † December. ‡ July. § January.

STOCKTON, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	13	6	1	5	13	16	5	7	27	24.1	26.4	26.6	25.7	77.9	44.3	67.8	63.2	3.5	4.7	3.1	3.8	14	12	5	6	4	22	0	0	0
Feb	13	1	1	14	9	12	7	4	26	32.4	32.5	33.9	32.9	69.4	35.6	58.8	54.6	4.8	5.5	4.7	5.0	8	12	9	5	0	6	0	0	0
Mar	0	0	0	25	7	10	5	13	33	34.8	36.1	36.2	35.7	63.1	29.8	49.4	47.4	6.1	6.1	3.5	5.2	8	14	9	4	0	3	0	0	0
Apr	5	2	6	19	9	9	10	17	13	36.9	37.8	38.8	37.8	67.9	33.9	52.4	51.4	4.3	3.2	4.6	4.0	10	17	3	5	0	1	2	0	0
May	4	7	5	28	24	8	6	9	2	48.6	48.6	51.4	49.5	74.7	36.8	58.2	56.6	2.7	4.4	2.9	3.3	16	10	5	11	0	0	9	8	0
June.....	2	3	7	47	7	4	0	5	15	59.7	62.2	61.9	61.3	78.7	42.9	61.4	61.0	2.8	4.2	3.5	3.5	15	12	3	12	0	0	19	9	0
July	6	4	0	60	10	2	1	2	8	63.1	72.1	67.8	67.7	72.5	43.8	59.4	58.6	2.7	3.7	2.3	2.9	16	12	3	7	0	0	31	4	0
Aug	1	5	3	49	16	6	3	2	8	63.2	67.5	64.1	64.9	81.9	52.3	64.2	66.1	3.1	4.8	2.6	3.5	15	13	3	8	0	0	26	4	0
Sept	2	2	1	33	27	4	2	3	16	62.0	60.2	63.7	62.0	86.3	44.7	74.4	68.5	3.8	5.2	4.3	4.4	11	13	6	15	0	0	9	5	0
Oct	6	9	6	42	10	7	2	3	8	52.8	55.3	54.8	54.3	89.3	57.4	77.6	74.8	3.9	4.9	3.2	4.0	13	13	5	12	0	0	0	2	0
Nov	6	6	3	19	13	17	4	5	17	41.1	43.3	44.6	43.0	88.1	52.5	81.8	74.1	3.4	3.5	3.1	3.3	15	9	6	7	0	2	0	0	0
Dec	6	5	2	4	4	24	11	19	18	31.6	30.1	32.8	31.5	79.0	46.3	71.4	65.8	4.5	4.9	4.6	4.7	10	15	6	10	1	11	0	0	0
Sums ..	61	50	35	345	149	119	56	89	191	550.3	572.1	576.6	566.3	929.4	520.3	776.8	742.1	45.6	55.1	42.4	47.6	151	152	63	102	5	45	96	32	0
	Percentages.																					Percentages.								
Means .	5.8	4.6	3.2	31.4	13.6	10.8	5.1	8.1	17.4	45.9	47.7	48.0	47.2	77.4	43.4	64.7	61.8	3.8	4.6	3.5	4.0	41.3	41.5	17.2	27.9	1.4	12.3	26.2	8.7	0.0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.17 a. m., 1.17 p. m., and 9.17 p. m., local time.

Correction for instrumental error of barometer used: From 5.17 a. m., January 1, to 9.17 p. m., December 31, 1884, inclusive, −.029 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.140; February, 3.130; March, 3.080; April, 3.030; May, 3.010; June, 2.920; July, 2.940; August, 2.940; September, 2.930; October, 3.030; November, 3.120; December, 3.140.

REMARKS.—July 1, 1884, elevation of rain-gauge changed from 5 inches to 12 inches above ground.

JNO. W. BYRAM,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

TATOOSH ISLAND, WASH.

Location of office on December 31, 1884, on island.

[Latitude, 48° 23′ N.; longitude, 124° 44′ W. Elevation of barometer above sea-level, 86 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.967	29.965	29.942	29.958	30.437	22	29.338	26	1.099	39.9	42.2	42.4	41.5	55.7	5	32.9	1	22.8	44.6	39.4	13.32	4.06	11	48	SW., E.	5, 29	E.	12,136
Feb	29.923	29.920	29.908	29.917	30.454	26	29.114	17	1.340	35.3	37.1	37.4	36.6	52.1	27	20.6	10	31.5	40.4	33.7	6.04	2.34	23	56	E.	19	E.	11,705
Mar	29.810	29.829	29.811	29.817	30.227	20	20.304	9	.923	41.3	44.4	42.4	42.7	52.0	30	25.3	6	26.7	47.9	38.8	2.41	.58	21, 22	52	E.	6	E.	8,839
Apr	29.820	29.833	29.821	29.828	30.202	3	20.368	13	.834	47.2	51.3	49.0	49.2	61.2	8	40.0	13	21.2	55.0	46.0	3.31	.69	12, 13	42	E.	7	E.	7,444
May	29.934	29.942	29.912	29.929	30.227	28	29.651	19	.576	48.5	53.1	51.0	50.9	63.8	18	42.7	4	21.1	57.2	47.4	4.45	1.56	6	40	S.	6	SW., W.	8,138
June	29.873	29.887	29.873	29.878	30.097	29	29.650	21	.447	50.6	55.8	53.4	53.3	64.2	29	46.0	1	18.2	59.8	50.1	3.98	1.06	15, 16	36	SW.	24	SW.	5,672
July	29.962	29.969	29.956	29.962	30.122	8	29.711	13	.411	52.9	58.8	55.6	55.8	64.5	23	49.7	13	14.8	62.1	52.6	1.73	.58	2	18	S.	5	SW.	3,790
Aug	29.924	29.937	29.909	20.923	30.160	28	29.683	26	.483	53.3	58.8	57.0	56.4	66.2	29	46.4	10	19.8	62.2	52.8	5.49	1.60	25, 26	44	E.	2	SW.	6,016
Sept	29.870	29.877	29.875	20.874	30.156	25	29.534	15	.622	50.9	54.5	53.2	52.9	62.3	10	43.2	29, 30	19.1	57.7	50.0	6.15	1.24	28, 29	31	SW.	26	E.	6,851
Oct	20.906	29.918	29.905	20.908	30.339	26	29.271	12	1.068	48.7	51.2	50.4	50.1	59.8	13	41.4	6	18.4	54.7	46.8	9.03	1.80	7, 8	44	SE.	7	E.	10,196
Nov	29.933	29.956	29.937	29.942	30.296	26	29.626	6	.670	47.8	49.0	48.5	48.4	58.0	6, 11	39.5	22	18.5	53.1	45.9	6.80	1.53	1	46	E., SW.	13, 25	E.	18,478
Dec	29.821	29.808	29.818	29.816	30.381	6, 7	29.082	25	1.299	35.4	36.4	36.1	36.0	52.4	3	18.8	28	33.6	40.4	32.9	12.47	2.85	20, 21	64	E.	16	E.	*12,231
Sums ..	358.755	358.836	358.667	358.752	......	..	....	..	9.772	551.8	592.6	576.4	573.8	...	.....	......	...	265.7	634.6	586.4	75.18	.....	.....	..	....	.....	....	†105,496
Means .	29.896	29.903	29.889	29.896	30.454	‡26	20.082	§25	.814	46.0	49.4	48.0	47.8	66.2	‖29	18.8	§28	22.1	52.9	44.7	..	.....	.....	..	....	.....	E.	....

* Wind data for December for 27½ days. † For 362½ days. ‡ February. § December. ‖ August

TATOOSH ISLAND, WASH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	0	2	61	6	7	9	2	3	3	36.5	37.2	37.4	37.0	87.9	83.0	83.2	84.7	6.7	7.1	6.3	6.7	9	4	18	17	0	0	0	0	0
Feb	1	0	53	5	7	10	5	0	6	31.1	30.7	32.2	31.3	84.6	78.0	81.7	81.4	5.5	5.9	5.0	5.5	10	9	10	17	3	11	0	0	1
Mar	0	2	31	6	12	12	10	7	13	36.3	37.0	37.2	36.8	83.4	76.5	83.1	81.0	5.5	6.9	6.6	6.3	4	13	14	14	0	2	0	0	1
Apr	0	3	28	6	9	25	7	5	7	42.8	44.6	44.4	43.9	85.7	78.6	84.8	83.0	6.5	5.9	5.7	6.0	8	8	14	12	0	0	0	0	0
May	1	4	19	3	15	22	22	5	2	44.5	46.9	46.2	45.9	86.6	79.9	84.0	83.5	5.0	5.4	5.0	5.1	11	11	9	7	0	0	0	0	1
June	1	0	11	2	15	28	24	6	3	48.0	50.9	49.4	49.4	90.8	84.0	86.6	87.1	6.6	7.0	6.8	6.8	3	12	15	11	0	0	0	0	0
July	0	1	10	0	8	37	20	7	10	50.8	54.3	52.6	52.6	92.6	85.3	89.6	89.2	7.0	6.5	7.6	7.0	2	14	15	9	0	0	0	0	0
Aug	1	4	18	0	24	29	11	4	2	51.7	55.7	54.9	54.1	94.3	89.6	92.8	92.2	3.9	5.0	3.9	4.3	14	10	7	9	0	0	0	3	0
Sept	1	1	39	5	11	11	16	4	2	48.8	50.6	49.8	49.7	92.7	86.8	88.4	89.3	7.9	6.9	5.2	6.7	4	15	11	18	0	0	0	1	1
Oct	0	2	31	21	12	16	7	4	0	45.7	47.8	46.5	46.7	89.5	88.3	86.9	88.2	5.7	6.3	6.3	6.1	8	9	14	17	0	0	0	2	0
Nov	0	1	55	26	3	4	0	1	0	44.2	45.8	45.3	45.1	88.5	88.9	88.8	88.7	6.3	7.5	7.0	6.9	2	12	16	17	0	0	0	0	0
Dec	0	8	51	15	2	5	1	11	0	29.3	30.4	29.6	29.8	78.8	79.1	77.8	78.6	6.5	6.5	5.5	6.2	6	11	14	16	4	16	0	0	0
Sums	5	28	407	95	125	208	125	57	48	509.7	531.9	525.5	522.3	1055.4	998.0	1027.7	1026.9	73.1	76.9	70.9	73.6	81	128	157	164	7	29	0	6	4
	Percentages.																					Percentages.								
Means	.5	2.6	37.1	8.6	11.4	18.9	11.4	5.2	4.4	42.5	44.3	43.8	43.5	88.0	83.2	85.6	85.6	6.1	6.4	5.9	6.1	22.1	35.0	42.9	44.8	1.9	7.9	.0	1.6	1.1

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.49 a. m., 11.49 a. m., and 7.49 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.100; March, 0.100; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.100; December, 0.100.

REMARKS.—Comet observed first time, January 14; first frost December 7; first snow December 13.

R. L. SEBASTIAN,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

THOMAS, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 33° 4′ N.; longitude, 110° 2′ W. Elevation of barometer above sea-level, 2,710 (B) feet. Elevation of exposed thermometer above ground, 3 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.*				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles*
Jan	27.416	27.356	27.351	27.374	27.707	1	27.090	10	.617	30.2	50.5	41.5	40.7	64.0	28	10.0	2	54.0	54.7	27.8	.45	.38	26	...	....	....	S.	....
Feb	27.801	27.231	27.238	27.257	27.530	22	26.840	6	.690	37.1	56.5	48.9	47.5	74.2	25	18.8	14	55.4	59.8	35.8	2.94	1.71	3, 4	...	....	....	W.	....
Mar	27.230	27.178	27.176	27.195	27.429	13	26.930	23	.499	40.9	61.3	53.4	51.0	73.5	14	26.8	2	46.7	65.1	39.3	3.21	1.00	4	...	....	....	W.	....
Apr	27.212	27.160	27.156	27.176	27.364	1	26.987	26	.377	42.0	69.2	58.2	56.5	84.5	24	31.8	1	52.7	72.4	41.2	.72	.26	4	..	....	....	W.	......
May	27.233	27.160	27.179	27.191	27.412	8	27.013	20	.399	52.2	80.2	67.8	66.7	95.0	31	36.9	3	58.1	84.3	49.3	.60	.28	19	...	....	....	W.	....
June	27.206	27.128	27.149	27.161	27.387	15	27.012	25	.375	60.1	92.0	78.9	77.0	105.0	25	47.4	1	57.6	95.5	57.2	.52	.50	14	...	....	....	W.	......
July	27.213	27.147	27.146	27.169	27.297	21	27.042	4	.255	71.7	99.7	87.7	86.4	112.5	5	61.4	19	51.1	102.8	69.8	.36	.30	10, 11	...	....	....	W.	.....
Aug	27.236	27.174	27.172	27.194	27.340	30	27.064	18	.276	68.8	91.7	82.6	81.0	106.5	5	54.4	19	52.1	96.0	67.4	2.04	1.23	22, 23	...	....	...	W.	.....
Sept	27.229	27.146	27.149	27.175	27.377	15	26.899	30	.478	59.2	85.0	72.6	72.6	90.5	22	42.9	28	56.6	89.3	57.1	.91	.67	14	...	....	...	S.	......
Oct	27.278	27.203	27.223	27.235	27.506	16	26.880	1	.626	55.1	75.8	64.7	65.2	89.5	5	33.1	28	56.4	78.1	52.4	.69	.30	10	...	....	...	S.	......
Nov	27.366	27.291	27.292	27.316	27.552	6	27.019	21	.533	38.4	65.6	50.3	51.4	77.0	4	23.8	29	53.2	66.5	35.0	.56	.34	8, 9	...	....	....	S.	......
Dec	27.274	27.196	27.223	27.231	27.532	1	26.856	27	.676	32.2	51.9	40.9	41.7	63.8	7	17.0	6	46.3	53.9	29.1	5.16	1.86	27	...	......	...	S.	....
Sums ..	327.194	326.370	326.454	326.674	......	...	....	...	5.801	587.9	880.3	747.5	738.6	....	..	......	...	640.2	918.4	561.4	18.16	....	......	...	....	....	....	....
Means .	27.260	27.198	27.204	27.223	27.707	†1	26.840	‡6	.483	49.0	73.4	62.3	61.6	112.5	§5	10.0	†2	53.4	76.5	46.8	.....	...	......	...	....	....	W.	......

* No anemometer used.

† January.

‡ February.

§ July.

THOMAS, FORT, ARIZ.—Continued

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of time observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	0	0	6	12	18	8	8	4	37	23.5	29.3	30.0	27.6	76.6	47.0	65.1	62.9	4.0	4.4	2.3	3.6	13	15	3	3	0	23	0	0	0
Feb	1	0	2	4	11	9	18	8	34	31.1	39.7	39.9	36.9	79.2	56.9	72.3	69.5	4.2	5.5	4.5	4.7	11	10	8	12	0	8	0	0	0
Mar	3	1	1	2	2	4	37	9	34	33.7	38.3	41.3	37.8	75.6	47.3	65.6	62.8	4.5	5.2	3.8	4.5	12	11	8	11	0	4	0	1	0
Apr	0	1	5	2	5	7	27	7	36	30.9	33.4	38.1	34.1	65.2	20.6	48.7	47.8	2.5	4.2	3.0	3.2	14	13	3	4	0	1	0	0	0
May	4	1	5	3	7	7	30	5	31	40.9	36.9	44.4	40.7	67.2	24.3	45.9	45.8	2.2	3.1	2.2	2.5	20	10	1	6	0	0	9	0	0
June	2	2	0	2	5	4	31	5	39	45.6	34.5	44.0	41.4	60.2	15.9	32.8	36.3	2.3	2.3	3.2	2.6	18	9	3	3	0	0	24	1	0
July	2	0	0	0	3	2	31	5	50	52.1	49.6	52.7	51.5	51.4	19.0	32.8	34.4	2.3	2.1	2.6	2.3	22	5	4	4	0	0	31	2	0
Aug	0	2	9	8	8	6	10	6	44	52.2	52.5	59.0	54.6	56.3	30.8	48.6	45.2	3.8	3.1	4.6	3.8	10	17	4	8	0	0	24	1	0
Sept	1	0	4	2	23	15	16	3	26	48.7	52.1	56.8	52.5	69.0	34.4	58.9	54.1	3.6	3.6	2.3	3.2	18	9	3	4	0	0	13	2	0
Oct	1	0	6	26	27	7	6	6	14	43.2	52.7	51.1	49.0	65.7	49.9	63.4	59.7	4.0	4.2	2.0	3.4	14	15	2	4	0	0	0	0	0
Nov	1	2	6	19	22	14	14	3	9	28.2	48.8	40.3	39.1	66.7	55.4	70.1	64.1	2.1	2.3	2.4	2.3	23	4	3	3	0	10	0	0	0
Dec	0	0	6	25	26	13	16	7	0	24.9	40.3	33.2	32.8	74.3	67.1	75.0	72.1	5.0	4.3	3.5	4.3	15	9	7	10	0	17	0	0	0
Sums	15	9	50	105	157	96	244	68	354	45.5	508.1	530.8	498.0	807.4	477.6	679.2	654.7	40.5	44.3	36.4	40.4	190	127	49	72	0	63	101	7	0
	Percentages.																					Percentages.								
Means	1.4	.8	4.6	9.6	14.3	8.7	22.2	6.2	32.2	37.9	42.3	44.2	41.5	67.3	39.8	56.6	54.6	3.4	3.7	3.0	3.4	51.9	34.7	13.4	19.7	0	17.2	27.6	1.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.014 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 2.830; February, 2.830; March, 2.780; April, 2.730; May, 2.670; June, 2.630; July, 2.590; August, 2.610; September, 2.640; October, 2.710; November, 2.840; December, 2.820.

G. A. MARTIN,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

TOLEDO, OHIO.

Location of office on December 31, 1884, Room 41, Finlay Block, corner Madison and Summit streets.

[Latitude, 41° 40′ N.; longitude, 83° 34′ W. Elevation of barometer above sea-level, 651 feet. Elevation of exposed thermometer above ground, 65 feet. Elevation of rain-gauge above ground, 106 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.405	20.375	29.414	29.398	29.906	26	28.741	2	1.225	16.6	24.4	19.1	20.0	53.8	30	—14.0	6	67.8	28.4	11.7	2.61	.68	30	39	SW.	3	SW.	6,232
Feb	29.323	29.304	29.301	29.309	29.817	15	28.5 3	19	1.224	27.5	32.7	29.5	29.9	50.3	19	— 0.5	29	59.8	38.0	23 9	3.03	.94	4, 5	33	W., NW.	5, 21	W.	5,520
Mar	29.311	29.297	29.307	29.305	29.712	30	28.691	26	1.021	31.0	39.3	35.3	35.2	63.5	23	8.0	2	60.5	42.9	28.2	2.09	.57	25, 26	38	W.	12	NE.	5,620
Apr	29.230	20.199	29.218	29.216	29.634	21	28.500	15	1.134	41.2	50.5	45.4	45.7	70.6	27	29.0	6	41.6	53.4	38.3	1.57	.69	15	44	NE.	22	E.	7,182
May	29.246	29.205	29.235	29.229	29.631	29	28.837	19	.794	55.8	65.8	57.9	59.8	82.0	23	36.5	29	45.5	68.7	51.0	4.71	1.72	6	32	SW.	2	SW.	1,890
June	29.370	29.332	29.339	29.347	29.652	15	28.951	9	.701	67.9	75.6	68.5	70.7	91.5	23	52.5	10	39.0	78.6	62.2	2.70	2.34	9, 10	40	NE.	26	E.	3,484
July[1]	29.220	29.184	29.200	29.201	29.451	21	28.962	5	.489	67.2	77.6	69.9	71.6	89.0	1	54.0	14	35.0	79.4	63.1	3.66	2.01	30, 31	30	SW.	5	W.	4,044
Aug	29.351	29.310	29.329	29.330	29.618	9	28.965	29	.653	64.5	76.7	68.7	70.0	91.5	17	47.5	9	44.0	78.7	61.6	1.48	1.20	28	24	S., SW.	3, 25	S.	4,754
Sept	29.372	29.321	29.350	29.348	20.736	13	28.968	28	.768	63.7	75.7	68.5	69.3	91.5	9	47.2	21	44.3	78.0	61.5	1.02	.39	24	38	S.	24	S.	5,781
Oct	29.443	29.401	29.416	29.420	29.825	14	29.057	8	.768	51.3	62.1	55.5	56.3	85.0	4	30.2	30	54.8	64.9	47.4	2.14	.82	8	28	NW.	8	S.	6,014
Nov[1], [2]	29.372	29.331	29.384	29.362	20.729	6	28.681	23	1.048	35.9	45.1	39.0	40.0	62.5	1	15.2	24	47.3	48.5	31.9	1.39	.84	3, 4	40	SW.	23	SW.	6,165
Dec	29.399	29.383	29.409	29.397	20.913	19	28.603	6	1.810	27.6	32.7	29.8	30.0	59.0	4	— 8.5	10	67.5	56.1	22.7	2.03	.43	27, 28	37	SW.	7	SW.	6,450
Sums	852.042	851.642	351.902	851.862	......	...	......	..	11.135	550.2	658.2	587.1	598.5	....	......	......	...	607.1	095.6	503.5	28.43	....	......	...	....	...	......	63,116
Means	29.337	29.303	29.325	29.322	29.966	[3] 26	28.500	[4] 15	.928	45.8	54.8	48.9	49.8	91.5	[5] 23 [6] 17 [7] 9	—14.0	[3] 6	50.6	58.0	42.0	.....	.....	......	...	....	...	SW.	......

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[1] One 3 p. m. observation missed. [2] One 11 p. m. observation missed. [3] January. [4] April. [5] June. [6] August. [7] September.

TOLEDO, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	6	9	1	1	5	33	30	7	1	11.7	16.4	13.8	14.0	80.8	72.3	79.8	77.6	7.2	7.5	6.4	7.0	3	13	15	12	19	29	0	1	0
Feb	2	13	6	6	9	13	15	14	9	23.2	25.5	25.2	24.6	83.6	75.3	83.5	80.8	9.0	8.5	7.9	8.5	1	8	20	16	8	25	0	0	0
Mar	13	18	5	7	4	10	15	8	13	25.4	27.8	28.2	27.1	79.6	65.0	75.5	73.4	7.3	7.7	5.8	6.9	4	12	15	15	8	15	0	2	0
Apr	10	18	19	4	4	3	12	14	6	32.6	33.2	34.6	33.5	72.5	53.9	67.4	64.6	6.4	6.2	5.3	6.0	7	11	12	7	0	3	0	0	1
May	4	10	7	2	9	22	18	9	12	47.5	47.9	47.9	47.8	73.7	55.9	70.4	66.7	5.2	6.1	3.5	4.9	8	16	7	15	0	0	0	3	0
June.....	4	19	20	4	9	4	7	3	20	60.5	59.9	60.5	60.3	77.8	59.8	76.5	71.4	4.0	5.5	3.8	4.4	11	12	7	7	0	0	1	14	0
July . ..	4	9	7	0	4	13	32	6	17	59.0	57.4	59.5	58.6	75.6	51.5	70.4	65.8	5.4	5.7	4.0	5.0	6	17	7	11	0	0	0	6	0
Aug	13	6	4	2	23	17	11	6	11	57.6	57.8	59.5	58.3	78.8	53.5	72.7	68.3	3.3	5.1	2.6	3.7	14	13	4	5	0	0	3	1	0
Sept	10	5	8	6	39	12	5	3	2	56.7	56.3	59.4	57.5	78.6	53.0	73.6	68.4	4.1	3.8	2.6	3.5	14	12	4	7	0	0	3	2	1
Oct	6	6	7	5	25	24	14	5	1	45.8	46.7	47.8	46.8	81.7	59.3	76.2	72.4	5.5	6.1	2.4	4.7	10	15	6	9	0	3	0	2	0
Nov	6	6	3	3	11	38	13	9	1	30.8	34.2	31.9	32.3	81.6	66.3	76.0	74.6	6.7	5.7	5.1	5.8	8	9	13	9	2	14	0	0	0
Dec......	2	7	5	8	18	27	15	7	4	21.8	25.7	24.3	23.9	78.4	75.3	79.7	77.8	8.1	8.5	6.3	7.6	3	9	19	20	12	23	0	0	0
Sums ..	80	126	92	48	160	216	187	91	97	472.6	488.8	492.6	484.7	942.7	741.1	901.7	861.8	72.2	76.4	55.7	68.0	89	147	129	133	49	112	7	31	2
	Percentages.																					Percentages.								
Means .	7.8	11.5	8.4	4.4	14.6	19.7	17.0	8.3	8.8	30.4	40.7	41.0	40.4	78.6	61.8	75.1	71.8	6.0	6.4	4.6	5.7	24.4	40.3	35.3	36.4	13.4	30.6	1.9	8.5	0.5

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.34 a. m., 2.34 p. m., and 10.34 p. m., local time.

Corrections for instrumental error of barometer used: From 6.34 a. m., January 1, to 10.34 p. m., November 8, inclusive, −.012 inch; from 6.34 a. m., November 9, to 10.34 p. m., December 31, 1881, inclusive, +.015 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.740; February, 0.740; March, 0.730; April, 0.710; May, 0.680; June, 0.680; July, 0.670; August, 0.670; September, 0.680; October, 0.700; November, 0.730; December, 0.740.

REMARKS.—January the coldest since 1873.

ALLEN BUELL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

TOTTEN, FORT, DAK.

Location of office on December 31, 1884, The Palmer House.

[Latitude, 47° 57′ N.; longitude, 98° 57′ W. Elevation of barometer above sea-level, 1,490 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 5 feet]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.					
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan																												
Feb																												
Mar																												
Apr																												
May																												
June*	28.323	28.317	28.313	28.318	28.486	9	28.074	10	.412	65.1	77.5	67.0	69.9	93.5	23	46.0	9	47.5	83.5	58.0	2.38	.77	12	48	W.	28	S.	7,828
July	28.327	28.310	28.319	28.319	28.548	19	28.094	22	.434	57.3	71.6	59.9	62.9	86.8	31	42.7	5	44.1	76.1	52.0	3.05	.69	23, 24	36	NE., NW.	4, 8	NW.	7,974
Aug	28.338	28.331	28.331	28.333	28.649	4	27.944	1	.705	57.0	74.8	61.0	64.6	94.5	27	43.6	23	50.9	77.8	53.0	3.72	1.38	15, 16	44	SW.	15	S.	9,828
Sept.†	28.270	28.234	28.269	28.258	28.643	10	27.804	2	.839	46.0	63.9	52.8	54.2	87.5	5	34.0	30	53.5	67.2	44.0	1.32	.59	22, 23	51	W.	3	W.	8,445
Oct	28.360	28.322	28.342	28.341	28.718	20 2[illegible]	27.886	5	.832	35.0	51.2	41.1	42.6	85.8	18	12.0	31	73.8	55.9	32.2	.92	.55	4, 5	44	NW.	6	NW.	11,696
Nov	28.439	28.422	28.441	28.434	28.837	16	27.928	26	.909	20.0	31.2	22.7	24.6	62.0	12	—22.2	23	84.2	34.5	13.8	.25	.08	20, 21	44	NW.	19	NW.	7,670
Dec	28.438	28.441	28.461	28.447	28.871	24	27.876	3	.995	—.1	6.0	.2	2.0	43.0	2	—35.0	31	78.0	9.8	—7.4	.48	.16	28, 29	38	NW.	20	NW.	9,157
Sums																												
Means																												

* For 22 days only.

† For 26 days only.

TOTTEN, FORT, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan																														
Feb																														
Mar																														
Apr																														
May																														
June	2	5	4	17	26	4	4	4	0	60.5	62.5	59.2	60.7	85.5	61.5	77.2	77.7	5.5	4.5	4.3	4.8	8	9	5	11	0	0	4	7	0
July	9	9	7	18	9	13	6	22	0	52.8	56.0	54.2	54.3	85.2	59.1	81.9	75.4	5.3	6.9	2.7	5.0	7	19	5	12	0	0	0	9	4
Aug	11	5	3	19	20	16	5	14	0	52.7	56.7	55.5	55.0	86.0	55.9	80.2	74.0	4.3	5.6	2.8	4.2	13	15	8	18	0	0	5	6	2
Sept	6	1	8	13	11	13	15	11	0	42.0	46.0	46.6	44.9	86.7	54.0	80.1	73.6	5.4	6.2	5.0	5.5	4	16	6	10	0	0	0	1	3
Oct	11	1	2	20	19	8	7	24	1	30.9	33.8	34.1	32.9	83.1	55.1	77.5	71.9	4.4	4.7	4.4	4.5	11	14	6	10	0	14	0	1	0
Nov	9	3	0	7	7	17	8	27	3	17.1	24.4	19.0	20.2	87.8	77.1	85.9	83.6	3.7	5.6	3.2	4.2	12	13	5	9	14	27	0	0	3
Dec	6	2	2	7	5	11	13	46	1	— 5.2	— 0.6	— 4.7	— 3.5	78.3	74.6	79.4	77.4	4.5	6.6	3.6	4.9	10	13	8	12	24	31	0	0	3
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.32 a. m., 1.32 p. m., and 9.32 p. m., local time.

Correction for instrumental error of barometer used: From 5.32 a. m., June 9, to 9.32 p. m., December 31, 1884, inclusive, + 0.004 inch.

REMARKS.—Began taking meteorological observations at 5.32 a. m. June 9th. No observations taken on September 14, 15, 16, and 17. First frost September 24; killing frost September 30. First snow of the season, October 21. Navigation closed November 12.

E. J. GLASS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

VICKSBURG, MISS.

Location of office on December 31, 1884, Baum's building, corner of Washington and Crawford streets.

[Latitude, 32° 22′ N.; longitude, 90° 53′ W. Elevation of barometer above sea-level, 241 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	In.	In.	In.	In.	In.		In.		In.	°	°	°	°	°		°		°	°	°	In.	In.						Miles.
Jan	30.029	29.993	30.019	30.014	30.432	21	29.567	14	.865	35.5	45.7	41.1	40.8	73.0	29	10.3	6	62.7	49.7	31.8	8.20	2.41	17, 18	29	NW.	1	SE.	5,740
Feb	29.855	29.805	29.848	29.836	30.222	15	29.422	27	.800	51.0	63.2	55.5	56.6	79.5	5	23.0	15	56.5	65.6	47.0	6.73	1.94	7	52	SW.	19	SE.	5,348
Mar	29.792	29.759	29.782	29.778	30.168	9	29.518	7	.650	54.0	66.2	59.7	60.0	79.6	31	35.0	2	44.6	67.8	51.6	8.29	2.25	17, 18	26	NW.	1	S.	5,177
Apr	29.750	29.716	29.722	29.729	30.015	3	29.302	14	.713	58.2	70.5	62.5	63.7	84.8	30	44.0	24	40.8	73.6	54.8	4.47	1.84	14, 15	40	SW.	14	S.	4,518
May	29.771	29.751	29.758	29.760	29.948	2	29.574	18	.374	66.5	78.9	70.1	71.8	87.8	26	57.3	10	30.5	81.4	63.0	11.76	2.40	2	29	SE.	24	SE.	4,022
June	29.766	29.734	29.746	29.740	29.935	1	29.585	24	.350	71.8	84.9	75.0	77.2	97.2	22	62.2	11	35.0	87.4	68.5	3.14	.99	3, 4	28	S.	25	E.	3,675
July	29.764	29.736	29.733	29.744	29.863	24	29.577	9	.286	77.8	91.2	80.3	82.9	98.7	6	70.2	4	28.5	93.8	74.7	5.75	1.95	8	25	SW., S.	3, 24	S.	3,825
Aug	29.831	29.796	29.808	29.812	29.938	21	29.599	29	.339	71.9	89.0	76.8	79.2	97.5	29	62.5	11	35.0	90.6	69.9	2.16	.62	1, 2	17	NW.	4	N.	3,045
Sept	29.834	29.791	29.813	29.813	29.985	15, 20	29.621	23	.364	71.2	87.6	76.8	78.5	93.6	11	62.5	1	31.1	89.8	70.2	5.12	2.69	3	21	SE.	8	SE.	3,467
Oct	29.916	29.869	29.896	29.894	30.189	24	29.685	26	.504	62.2	78.3	67.3	69.3	93.7	5	39.2	24	54.5	79.0	60.7	1.08	.72	26, 27	18	SE.	26	N.	3,456
Nov	29.936	29.903	29.930	29.923	30.296	6	29.442	22	.854	47.4	63.7	52.9	54.7	75.3	2, 3	32.2	24	43.1	65.5	44.2	2.48	1.31	22	23	W.	22	N.	3,511
Dec	29.856	29.830	29.875	29.854	30.239	19	29.415	5	.824	46.5	55.6	50.5	50.9	73.8	11	18.1	19	55.7	59.7	41.8	13.52	5.82	28, 29	27	SW.	11	SE.	5,750
Sums	358.100	357.683	357.930	357.906	....	....	....	...	6.923	713.5	874.8	768.5	785.6	.	...	.	...	518.0	904.8	678.2	72.70	......	......	...	....	....	....	51,584
Means	29.842	29.807	29.828	29.826	30.432	*21	29.302	†14	.577	59.5	72.9	64.0	65.5	98.7	‡6	10.3	*6	43.2	75.4	56.5	..	......	......	...	....	....	SE.	......

* January. † April. ‡ July.

VICKSBURG, MISS.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.									
										Washington time.																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	*Ft.*	*In.*		*Ft.*	*In.*		*Ft.*	*In.*	*Ft.*	*In.*
Jan	17	5	8	20	8	14	6	13	2	29.2	33.7	32.0	31.6	77.4	63.8	71.1	70.8	5.9	6.2	4.6	5.6	5	17	9	15	2	16	0	0	36	2	11, 12	23	11	1	12	3	32	9
Feb	7	3	9	24	15	10	2	13	4	44.4	45.3	43.1	44.3	78.7	55.9	65.0	66.5	5.2	5.2	3.9	4.8	11	8	10	15	0	4	0	0	44	11	29	30	8	6	14	3	38	11
Mar ...	15	8	9	11	21	9	4	11	5	45.0	47.1	45.5	45.9	73.3	55.2	62.3	63.6	6.0	5.8	3.9	5.2	12	9	10	13	0	0	0	0	49	0	23	45	0	1	4	0	46	10
Apr ...	8	4	10	13	16	14	5	14	6	49.6	52.8	51.4	51.3	74.4	55.8	68.3	66.2	5.9	5.4	4.0	5.1	8	12	10	12	0	0	0	2	47	8	1	45	2	26–30	2	6	45	10
May ...	13	13	7	20	11	14	1	7	7	61.2	64.2	62.2	62.5	83.5	62.5	76.8	74.3	6.2	5.7	3.7	5.2	7	15	9	13	0	0	0	9	45	9	6–9	42	0	31	3	9	44	10
June ..	11	5	21	15	13	12	3	8	2	67.3	69.2	68.1	68.2	85.9	61.0	79.6	73.5	5.2	4.6	2.4	4.1	11	15	4	11	0	0	11	3	41	4	1	30	1	30	11	3	34	00
July ...	8	6	7	17	20	19	6	3	7	71.8	73.9	73.1	72.9	83.2	58.2	79.3	73.6	4.2	4.2	1.9	3.4	14	16	1	8	0	0	28	3	29	7	1	19	4	31	10	3	24	10
Aug ...	26	8	13	16	5	4	4	10	7	66.7	68.5	67.2	67.5	84.2	51.3	73.0	69.5	2.2	3.6	.7	2.2	22	9	0	8	0	0	22	6	18	8	9–12	9	1	31	9	7	15	2
Sept ...	9	7	23	25	4	5	5	10	2	67.0	68.0	68.4	67.8	86.6	53.9	76.0	72.2	2.3	3.8	2.8	3.0	18	8	4	6	0	0	15	3	9	9	11–12	5	1	30	4	8	7	6
Oct ..	33	3	15	10	6	4	2	15	5	57.3	59.7	59.6	58.9	84.6	56.3	76.4	72.4	3.3	4.5	2.3	3.4	19	6	6	5	0	0	8	0	18	0	13	5	1	1	12	11	13	11
Nov ...	17	7	10	16	6	10	6	14	4	40.3	43.3	41.8	41.8	76.7	49.6	67.3	64.5	3.5	4.0	1.9	3.1	16	9	5	7	0	0	0	1	14	1	4	5	8	30	8	5	9	9
Dec	16	11	13	22	8	10	3	7	3	40.7	42.9	40.9	41.5	80.3	66.1	71.1	72.5	6.7	6.6	6.2	6.5	7	7	17	13	0	5	0	2	15	11	26	4	10	15	11	1	10	2
Sums	180	80	145	209	133	125	47	125	54	640.5	668.6	653.3	654.2	968.8	689.6	866.2	841.6	56.6	59.6	38.3	51.6	150	131	85	126	2	25	84	29	....		....	....		.....	100	59	324	6
	Percentages.																					Percentages.																	
Means.	16.4	7.3	13.2	19.0	12.1	11.4	4.3	11.4	4.9	53.4	55.7	54.4	54.5	80.7	57.5	72.2	70.1	4.7	5.0	3.2	4.3	41.0	35.8	23.2	34.4	.5	6.8	23.0	7.9	49	0	*23	4	10	†15	8	9	27	0.5

* March.

† December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time.

Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m., December 31, 1884, inclusive, —.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.270; February, 0.270; March, 0.260; April, 0.260; May, 0.250; June, 0.250; July, 0.240; August, 0.240; September, 0.250; October, 0.260; November, 0.270; December, 0.270.

REMARKS.—During the months of February, March, April, May, and June the Mississippi River rose to a great height, causing floods that inundated the country in this vicinity for miles around, the water spreading as far west as Monroe, La., with great damage to the levees on that side. The planting of crops was much retarded, while great uneasiness and apprehension was felt among the residents of the valley while the water remained above the danger line. The river fell steadily after about June 1.

FRED. W. MIXER,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

WEST LAS ANIMAS, COLO.

Location of office on December 31, 1884, Saint Ange avenue, between Twelfth and Thirteenth streets.

[Latitude, 38° 4′ N.; longitude, 103° 12′ W. Elevation of barometer above sea-level, 3,899 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 7 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	26.101	26.057	26.095	26.084	26.443	1	25.615	9	.828	13.1	36.6	20.5	23.4	68.2	28	—10.5	16	78.7	40.9	8.3	.26	.15	14, 15	32	N.	9	W.	5,372
Feb	25.960	25.921	25.963	25.948	26.295	22	25.304	18	.991	15.1	36.0	22.3	24.5	71.2	24	—22.7	14	93.9	41.1	11.4	.50	.13	11	44	W.	20	W.	5,930
Mar	25.894	25.842	25.874	25.870	26.302	13	25.257	10	1.045	27.9	51.3	37.9	39.0	79.3	30	9.2	8	70.1	56.8	24.7	1.19	.99	24	48	SW.	10	W.	8,098
Apr	25.953	25.905	25.955	25.938	26.338	20	25.459	13	.879	35.2	58.4	45.0	46.2	79.2	24	22.0	21	57.2	62.2	33.0	1.05	.72	18, 19	50	NW.	13	W.	7,540
May	26.022	25.975	26.019	26.005	26.325	8	25.605	21	.720	46.2	68.4	54.4	56.3	90.4	9	27.5	6	62.9	72.7	43.5	4.46	2.12	28	49	N.	4	SE.	6,094
June	26.053	26.007	26.051	26.037	26.250	18	25.802	5	.448	58.2	80.5	65.5	68.1	97.7	27	47.5	1	50.2	84.2	55.4	2.79	.56	9, 10	40	NW.	26	E.	5,174
July	26.038	25.995	26.005	26.013	26.268	9	25.837	7	.431	63.1	88.3	74.0	75.1	104.0	6	52.3	31	51.7	92.9	60.8	1.75	.73	17	40	W.	1	E.	5,539
Aug	26.088	26.052	26.077	26.072	26.302	4	25.743	19	.559	58.9	82.8	69.6	70.4	101.0	1	51.7	31	49.3	86.2	57.0	2.17	.80	23, 24	31	E.	7	E.	5,323
Sept	25.993	25.941	25.963	25.966	26.325	19	25.688	29	.637	54.2	82.1	66.0	67.4	95.3	2	37.4	30	57.9	85.7	51.7	.06	.05	26	29	S.	7	S.	5,978
Oct	26.102	26.034	26.073	26.070	26.394	16	25.679	1	.715	43.5	71.0	53.4	56.0	90.5	6	23.2	31	67.3	74.4	41.2	.43	.19	1, 2	32	S.	2	S.	5,256
Nov	26.126	26.072	26.122	26.107	26.364	5	25.643	21	.721	26.5	54.8	33.8	38.4	75.2	6	7.8	23	67.4	57.6	22.9	.32	.22	10	32	NW.	29	NW.	3,847
Dec	25.958	25.906	25.964	25.943	26.376	31	25.429	21	.947	12.1	30.5	15.9	19.5	69.7	1	—21.5	31	91.2	34.6	8.1	.72	.31	29, 30	38	N.	4	W.	4,557
Sums	312.288	311.707	312.161	312.053	......	...	......	...	8.921	454.0	740.7	558.3	584.3	......	...	......	...	797.8	789.3	418.0	15.70	......	......	...	......	...	......	68,708
Means	26.024	25.976	26.013	26.004	26.443	*1	25.257	†10	.743	37.8	61.7	46.5	48.7	104.0	‡6	—22.7	§14	66.5	65.8	34.8	......	......	......	...	......	...	W.	......

* January. † March. ‡ July. § February.

WEST LAS ANIMAS, COLO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	5	10	16	4	3	9	33	13	0	9.4	14.5	12.3	12.1	86.7	47.2	75.9	69.9	3.1	4.1	3.0	3.4	14	16	1	6	11	31	0	0	0
Feb	7	11	16	4	8	4	26	10	1	11.7	16.2	15.6	14.5	87.0	54.5	78.9	73.5	3.7	6.3	2.8	4.3	9	16	4	6	9	29	0	0	0
Mar	11	4	18	10	5	12	19	13	1	20.5	17.0	20.1	19.2	74.1	30.3	53.4	52.8	4.5	5.1	3.5	4.4	9	18	4	4	1	25	0	2	0
Apr	14	7	9	12	4	10	18	12	4	26.5	22.1	27.8	25.5	73.7	30.0	57.7	53.8	4.5	6.1	5.9	5.5	4	18	8	8	0	14	0	0	0
May	14	8	14	17	7	9	12	7	5	40.5	36.3	40.6	39.1	81.1	36.2	62.1	59.8	4.5	6.3	5.7	5.5	6	16	9	12	0	2	1	10	0
June	2	8	27	10	8	13	5	9	8	52.2	48.6	52.4	51.1	81.4	36.7	65.7	61.3	4.2	4.9	5.2	4.8	10	16	4	12	0	0	10	9	0
July	5	18	21	9	9	11	13	3	4	55.0	50.2	53.7	53.0	76.6	30.8	52.5	53.1	4.1	4.2	3.5	3.9	11	15	5	5	0	0	22	3	0
Aug	1	11	28	10	11	12	13	3	4	50.7	47.0	51.1	49.6	76.0	33.4	56.4	55.3	4.2	4.2	4.1	4.2	12	12	7	8	0	0	8	3	0
Sept	6	12	9	8	16	15	11	10	3	41.9	39.1	42.8	41.3	65.2	23.6	46.3	45.0	2.6	3.1	3.2	3.0	17	11	2	2	0	0	9	2	0
Oct	6	12	11	9	22	12	14	6	1	38.0	45.4	43.6	42.3	82.3	41.7	71.1	65.0	4.1	4.3	3.1	3.8	13	12	6	7	0	8	1	1	0
Nov	8	13	9	5	3	9	20	21	2	21.6	27.7	23.8	24.4	82.6	39.3	67.9	63.3	3.4	3.6	2.4	3.1	17	9	4	2	0	27	0	0	0
Dec	8	13	18	2	6	2	22	11	11	8.7	15.3	10.0	11.3	87.9	62.2	79.7	76.6	4.6	5.9	3.8	4.8	10	14	7	5	16	31	0	0	0
Sums	87	127	196	100	102	118	206	118	44	376.7	379.4	393.8	383.4	954.6	465.9	767.6	729.4	47.5	58.1	46.2	50.7	132	173	61	77	37	167	51	30	0
	Percentages.																					Percentages.								
Means	7.9	11.6	17.9	9.1	9.3	10.7	18.8	10.7	4.0	31.4	31.6	32.8	31.9	79.6	38.8	64.0	60.8	4.0	4.8	3.8	4.2	36.1	47.2	16.7	21.0	10.1	45.6	13.9	8.2	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.15 a. m., 1.15 p. m., and 9.15 p. m., local time.

Correction for instrumental error of barometer used: From 5.15 a. m., January 1, to 9.15 p. m., December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.13; February, 4.12; March, 4.07; April, 3.96; May, 3.85; June, 3.77; July, 3.75; August, 3.74; September, 3.83; October, 3.98; November, 4.11; December, 4.15.

F. H. BRANDENBURG,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

WILMINGTON, N. C.

Location of office on December 31, 1884, Western Union office, in Dawson Bank building, Front street.

[Latitude, 34° 14′ N.; longitude, 77° 57′ W. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 44 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	30.165	30.106	30.155	30.142	30.677	27	29.397	8	1.280	40.6	49.9	42.5	44.3	71.4	24	9.0	6	62.4	53.6	35.6	5.22	2.04	8	36	SE.	8	SW.	5,737
Feb	30.073	30.031	30.078	30.061	30.509	16	29.442	28	1.067	51.9	62.7	55.0	56.5	75.4	8	28.8	29	46.6	66.6	48.2	3.80	1.26	17	33	NW.	23	SW.	5,577
Mar	30.020	29.966	30.016	30.001	30.379	16	29.555	29	.824	53.8	64.2	56.7	58.1	77.7	24	29.7	4	48.0	67.1	50.5	6.07	3.53	25, 26	34	SW.	9	SW.	6,620
Apr	29.891	29.824	29.875	29.863	30.180	12	29.265	2	.915	55.5	67.6	58.5	60.5	84.2	29	41.3	10	42.9	69.6	52.0	2.45	1.16	21, 22	35	W	2	NW.	4,636
May	29.955	29.903	29.944	29.934	30.196	3	29.651	11	.545	67.8	77.9	68.9	71.5	88.6	11	51.2	30	37.4	80.2	63.9	3.70	1.26	27	23	NW.	27	SW.	3,973
June	30.022	29.983	30.011	30.005	30.247	16	29.736	10, 11	.511	69.7	79.8	72.1	73.9	89.7	21	51.0	2	38.7	81.8	65.9	7.94	1.83	11	24	SW.	25	S.	4,086
July	29.920	29.867	29.908	29.897	30.094	23	29.714	16	.380	76.8	85.0	77.4	79.7	94.0	18	67.0	9	27.0	87.4	73.2	8.29	1.67	18, 19	24	SW.	31	SW.	4,369
Aug	30.006	29.970	29.999	29.992	30.176	19	29.740	30	.436	73.4	82.1	75.3	76.9	90.0	30	63.3	15	26.7	84.6	70.6	9.58	3.14	1, 2	19	S.	29	NE.	3,432
Sept	30.077	30.037	30.072	30.062	30.225	14	29.793	17	.432	70.6	81.7	73.4	75.2	89.0	29	57.7	15	31.3	83.9	67.5	9.34	6.77	12, 13	22	NE.	14	SE.	3,528
Oct	30.130	30.063	30.106	30.101	30.467	30	29.842	30	.625	68.6	76.2	65.8	68.5	92.5	6	40.7	24	51.8	77.8	59.7	.63	.61	30	19	NE.	15	NE.	3,870
Nov	30.084	30.028	30.059	30.055	30.380	7	29.493	28	.887	50.7	65.8	55.6	57.4	76.5	19	35.0	25	41.5	67.6	48.1	1.96	.86	28	28	SW.	29	NE.	3,390
Dec	30.156	30.094	30.132	30.127	30.491	20	29.716	18	.775	46.4	57.1	50.2	51.2	74.9	31	16.6	20	58.3	60.6	42.4	3.72	1.07	21	30	SW.	15	N.	5,359
Sums ..	360.499	359.872	360.350	360.240	....	...	....	....	3.677	720.8	850.0	751.4	773.7	...	....	....	...	512.6	880.8	677.6	62.70	....	......	...	....	....	....	54,077
Means .	30.042	29.989	30.029	30.020	30.677	*27	29.265	†2	.723	60.0	70.8	62.6	64.5	94.0	‡18	9.0	*6	42.7	73.4	56.5	.....	....	......	...	....	....	SW.	......

* January. † April. ‡ July.

WILMINGTON, N. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan	21	14	3	1	5	24	13	12	0	34.5	35.1	34.1	34.6	79.1	58.8	72.5	70.1	6.3	5.8	4.7	5.6	6	17	8	13	1	10	0	0	0
Feb	6	7	7	12	13	21	7	9	5	46.7	47.7	48.2	47.5	82.9	60.8	78.5	74.1	6.1	4.6	3.4	4.7	9	13	7	11	0	1	0	2	0
Mar	8	6	3	10	10	25	12	16	3	45.7	45.4	47.8	46.3	77.1	55.0	74.3	68.8	5.6	5.8	3.5	5.1	8	14	9	14	0	2	0	2	0
Apr	9	4	7	10	3	16	6	23	12	46.5	43.3	48.4	46.1	73.3	45.8	71.0	63.4	4.7	4.4	2.2	3.8	10	17	3	9	0	0	0	1	0
May	4	13	7	14	9	25	3	11	7	61.9	59.9	62.6	61.5	81.4	55.5	80.7	72.5	4.6	4.3	2.7	3.9	13	14	4	8	0	0	0	4	0
June	5	16	7	13	24	20	0	1	4	63.9	63.8	66.1	64.6	82.1	60.6	82.0	74.9	5.1	5.7	4.5	5.1	10	14	6	12	0	0	0	3	0
July	5	5	3	2	8	48	8	10	4	71.7	70.4	71.7	71.3	84.5	64.0	83.1	77.2	5.2	6.0	3.6	4.9	8	17	6	16	0	0	5	9	0
Aug	6	25	6	13	10	20	3	2	8	69.5	70.7	70.3	70.2	87.8	69.4	84.8	80.7	6.1	6.6	3.7	5.5	6	17	8	12	0	0	0	6	0
Sept	3	18	13	21	6	7	2	5	15	66.5	66.5	68.2	67.1	87.0	61.5	84.0	77.5	3.6	4.5	2.2	3.4	17	10	3	5	0	0	0	0	0
Oct	7	25	19	6	3	8	5	5	15	57.8	59.1	59.2	58.7	81.7	57.3	80.0	73.0	4.9	3.7	1.6	3.4	15	12	4	3	0	0	2	1	0
Nov	12	20	5	5	5	7	5	15	16	43.1	47.6	47.4	46.0	75.4	53.9	74.6	68.0	5.1	4.2	2.8	4.0	11	15	4	6	0	0	0	0	0
Dec	21	18	7	5	7	15	7	9	4	40.5	45.8	43.4	43.2	80.4	68.6	78.2	75.7	6.4	6.5	5.9	6.3	8	9	14	16	0	3	0	1	0
Sums	107	171	87	112	103	236	71	118	93	648.3	655.3	667.4	657.1	972.7	711.2	943.7	875.9	63.7	62.6	40.8	55.7	121	169	76	125	1	16	7	29	0
	Percentages.																					Percentages.								
Means	9.7	15.6	7.9	10.2	9.4	21.5	6.5	10.7	8.5	54.0	54.6	55.6	54.7	81.1	59.3	78.6	73.0	5.3	5.2	3.4	4.6	33.0	46.2	20.8	34.2	.3	4.4	1.9	7.9	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time.

Correction for instrumental error of barometer used: From 6.56 a. m., January 1, to 10.56 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.06; February, 0.06; March, 0.06; April, 0.06; May, 0.05; June, 0.05; July, 0.05; August, 0.05; September, 0.05; October, 0.05; November, 0.06; December, 0.06.

REMARKS.—Slight shock of an earthquake, January 18. Waterspout over Cape Fear River, March 25. First killing frost, October 24.

J. H. JONES,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

WINNEMUCCA, NEV.

Location of office on December 31, 1884, corner of Bridge street and Fifth avenue.

[Latitude, 40° 59′ N.; longitude, 117° 43′ W. Elevation of barometer above sea-level, 4,358 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 5 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan																												
Feb																												
Mar																												
Apr																												
May																												
June																												
July																												
Aug																												
Sept																												
Oct																												
Nov																												
Dec*	25.514	25.511	25.509	25.511	25.927	4	25.101	26	.826	26.9	40.0	32.8	33.2	56.2	18	.0	31	56.2	43.9	22.7	3.29	.93	21, 22	46	SW.	23	SW.	7,787
Sums																												
Means																												

*Observations commenced 7 a. m., December 1.

WINNEMUCCA, NEV.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
										Washington time.																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
1884.										°	°	°	°																	
Jan																														
Feb																														
Mar																														
Apr																														
May																														
June																														
July																														
Aug																														
Sept																														
Oct																														
Nov																														
Dec	4	25	7	2	2	45	4	2	2	17.4	21.5	20.7	19.9	68.6	49.5	61.9	60.0	5.1	5.4	3.6	4.7	13	9	9	11	3	20	0	0	0
Sums																														
	Percentages.																					Percentages.								
Means																														

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 4.17 a. m., 12.17 p. m., and 8.17 p. m., local time.
Correction for instrumental error of barometer used: From 4.17 a. m., December 1, to 8.17 p. m., December 31, 1884, inclusive, +.010 inch.

CHAS. A. READ,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

YANKTON, DAK.

Location of office on December 31, 1884, corner Third and Capitol streets.

[Latitude, 42° 54′ N.; longitude, 97° 28′ W. Elevation of barometer above sea-level, 1,228 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 28 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Total movement.
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Largest amount.	Date.	Miles.	Direction from—	Date.		
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	28.886	28.831	28.858	28.858	29.496	4	28.156	9	1.340	7.0	19.6	18.8	13.5	49.6	28	—28.0	5	77.6	25.6	3.0	.25	.14	6, 7	33	N.	10	N.	5,923
Feb	28.775	28.727	28.781	28.761	29.165	11	27.974	18	1.191	7.3	18.3	10.6	12.1	51.8	1	—23.1	9	74.9	22.1	1.4	1.80	1.02	4, 5	40	N.	20	NW.	6,817
Mar	28.677	28.660	28.668	28.668	29.112	13	27.750	10	1.362	24.8	35.7	29.1	29.9	65.8	26	—10.9	9	76.7	39.9	21.6	.92	.23	21, 22	40	NW.	11	NE.	6,141
Apr......	28.668	28.652	28.668	28.663	29.143	21	28.086	26	1.057	37.3	50.4	42.9	43.5	72.1	25	27.1	8	45.0	52.9	35.9	5.73	1.97	1	56	SE.	29	N.	8,897
May	28.685	28.645	28.641	28.657	28.947	29	28.810	19	.637	51.9	69.0	57.8	59.6	82.5	20	34.1	2	48.4	70.8	49.6	1.43	.56	21, 22	44	SW.	20	N.	6,923
June	28.693	28.657	28.664	28.671	28.863	2	28.394	11	.469	64.6	80.7	69.9	71.7	93.8	30	47.3	2	46.5	83.2	61.3	1.72	.97	6	29	E.	25	S.	5,386
July	28.661	28.628	28.627	28.637	28.913	19	28.347	22	.566	64.6	78.8	69.6	71.0	93.8	7	55.7	6	38.1	82.0	62.4	4.63	1.97	27	45	N.	3	SE., NE.	5,446
Aug	28.725	28.690	28.686	28.700	29.030	9	28.335	19	.695	61.8	77.7	67.4	69.0	90.4	28	48.1	8	42.3	79.8	60.1	2.61	1.63	24	28	SW., S.	1, 24	S.	3,113
Sept	28.610	28.584	28.601	28.598	29.057	20	28.185	2	.872	56.8	74.1	62.0	64.3	88.4	5	39.0	30	49.4	76.6	53.8	.28	.10	23, 20	33	SW.	25	S.	6,168
Oct	28.744	28.716	28.717	28.726	29.124	23	28.331	19	.793	46.4	68.1	52.1	58.9	87.3	18	24.7	23	62.6	65.7	43.4	1.97	.86	25, 26	33	SW.	26	N., SW.	7,485
Nov	28.803	28.772	28.798	28.789	29.206	5	28.268	26	.938	27.2	48.4	33.0	34.5	66.3	8	— 3.0	23	69.3	46.4	24.0	.02	.02	21, 22	28	N.	22	N.	4,643
Dec......	28.829	28.804	28.841	28.825	29.399	24	28.244	8	1.155	8.3	16.8	10.4	11.8	57.4	3	—23.3	18	80.7	19.4	4.2	.80	.17	13, 14, 21	31	N.	30	NW., N.	5,574
Sums ..	344.756	344.361	344.545	344.553	......	..	......	...	11.675	458.0	627.6	518.6	584.8	....	....	......	...	711.5	664.4	420.2	22.16	....	....	...	....	....	....	72,016
Means .	28.730	28.697	28.712	28.718	29.496	*4	27.750	†10	.923	38.2	52.3	43.2	44.6	93.8	{‡30 §7}	—28.0	*5	59.3	55.4	35.0	....	....	....	...	....	....	N.	......

*January. †March. ‡June. §July.

YANKTON, DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from— North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Dew-point. Washington time. 7 a. m.	3 p. m.	11 p. m.	Mean.	Relative humidity (per cent.). 7 a. m.	3 p. m.	11 p. m.	Mean.	Cloudiness (in tenths). 7 a. m.	3 p. m.	11 p. m.	Mean.	Number of days— Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	River. Highest. Ft.	In.	Date.	Lowest. Ft.	In.	Date.	Range. Ft.	In.	Mean. Ft.	In.
1884.										°	°	°	°																												
Jan	23	4	4	3	6	5	18	17	13	1.0	8.9	7.5	5.8	76.3	64.7	75.7	72.2	4.1	5.8	2.8	4.2	10	16	5	6	16	31	0	0	0	Frozen.									
Feb	23	8	4	2	8	4	8	24	6	.2	7.8	3.1	3.7	72.8	64.1	72.0	69.6	5.3	5.7	5.1	5.4	8	11	10	7	19	28	0	0	0	Frozen.									
Mar	15	16	13	6	10	3	14	10	6	18.9	24.2	22.3	21.8	78.1	64.4	76.0	72.8	5.9	7.3	4.8	6.0	6	14	11	11	7	21	0	1	0	*18	0	22	15	2	30	2	10	16	0.3
Apr	28	12	5	11	12	6	2	14	0	33.0	33.3	35.9	34.1	84.5	56.2	76.2	72.3	5.7	5.7	3.7	5.0	10	10	10	14	1	11	0	4	1	20	1	4	6	6	25	13	7	11	2.9
May	21	8	6	13	8	8	14	12	3	46.4	44.1	48.3	46.3	82.0	43.6	72.0	65.9	4.2	5.0	3.0	4.1	12	14	5	11	0	0	0	2	0	10	8	31	6	0	20 21 25	4	8	7	2.2
June	10	5	11	15	25	12	1	5	6	60.8	62.4	63.6	62.3	87.6	54.9	80.6	74.4	3.2	5.0	2.0	3.4	12	17	1	7	0	0	4	2	0	20	3	21	10	10	1	9	5	17	1.7
July	9	16	15	16	9	9	3	13	3	60.6	62.7	63.7	62.3	87.4	59.3	82.0	76.2	4.9	4.9	3.1	4.3	9	17	5	18	0	0	4	10	0	19	11	4, 5	16	10	26	3	1	18	2.2
Aug	11	2	2	14	20	9	12	10	13	57.7	60.1	61.6	59.8	86.8	56.8	82.3	75.3	4.5	5.3	2.5	4.1	11	17	3	9	0	0	1	2	0	17	3	1	14	10	23	2	5	15	10.2
Sept	17	4	7	7	21	12	6	9	7	51.2	53.1	53.5	52.6	82.3	51.0	74.4	69.2	4.5	4.5	3.9	4.3	10	14	6	5	0	0	0	2	0	15	9	1	10	9	30	5	0	13	3.7
Oct	19	6	3	8	11	19	13	10	4	39.4	39.0	41.5	40.0	77.1	45.5	68.9	63.8	4.4	4.6	3.0	4.0	12	12	7	6	0	6	0	0	0	10	9	2–4	8	3	31	2	6	9	4.5
Nov	22	10	2	7	5	10	10	18	6	22.7	29.0	27.1	26.3	82.9	58.8	79.3	73.7	3.8	4.3	3.1	3.7	13	13	4	2	4	25	0	0	0	8	2	1	6	1	22–30	2	1	6	9.1
Dec	25	3	1	4	15	2	7	25	11	3.3	7.5	4.9	5.2	79.6	68.8	78.3	75.6	4.7	6.4	5.0	5.4	8	14	9	11	22	30	0	0	0	6	0	1–4	5	9	13, 14	0	3	5	10.6
Sums ..	223	94	73	106	150	99	108	167	78	395.2	432.1	433.0	420.2	977.4	688.1	917.7	861.0	55.2	64.5	42.0	53.9	121	169	76	102	69	152	9	23	1	......		...	......		......	......		......	
	Percentages.																					Percentages.																		
Means .	20.3	8.6	6.6	9.7	13.7	9.0	9.8	15.2	7.1	32.9	36.0	36.1	35.0	81.4	57.3	76.5	71.7	4.6	5.4	3.5	4.5	33.1	46.2	20.8	27.9	18.9	41.5	2.5	6.3	.3	20	3	†1	5	9	†13, 14	......		......	

* Ten days only.

† June.

‡ December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time.

Correction for instrumental error of barometer used: From 5.38 a. m., January 1, to 9.38 p. m., December 31, 1884, inclusive, + .011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.42; February, 1.42; March, 1.39; April, 1.34; May, 1.28; June, 1.28; July, 1.27; August, 1.27; September, 1.29; October, 1.33; November, 1.38; December, 1.43.

REMARKS.—January 1 and 3, solar halo; February 5 and 12, solar halo; February 5 and 13, parhelion; April 24, aurora; December 31, solar halo.

E. H. THOMPSON,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

YUMA, ARIZ.

Location of office on December 31, 1884, quartermaster's office.

[Latitude, 32° 45′ N.; longitude, 114° 36′ W. Elevation of barometer above sea-level, 141 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).									Temperature.											Precipitation.			Wind.				
	Washington time.									Washington time.				Self-registering thermometers.								Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.				
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.
1884.	*In.*	*In.*	*In.*	*In.*	*In.*		*In.*		*In.*	°	°	°	°	°		°		°	°	°	*In.*	*In.*						*Miles.*
Jan	29.975	29.988	29.972	29.978	30.485	1	29.651	25	.834	47.5	62.6	53.7	54.6	71.7	12	36.6	18	35.1	65.8	43.8	[1]—	[1]—	15–17	33	N.	23	N.	4,582
Feb	29.872	29.904	29.885	29.887	30.203	13	29.440	6	.763	51.5	63.6	56.9	57.3	84.2	26	34.1	14	50.1	67.1	48.8	1.58	.70	3	30	W.	6	N.	4,780
Mar	29.801	29.836	29.810	29.816	30.051	13	29.554	23	.497	53.4	68.9	60.5	60.9	81.3	18	42.6	31	38.7	72.4	51.0	1.48	1.31	3, 4	32	NW.	23	W.	4,364
Apr.[2]	29.756	29.776	29.738	29.757	30.038	1	29.515	27	.523	56.6	78.1	67.6	67.4	95.0	23	45.1	28	49.9	82.5	58.7	.07	.07	27	23	W.	16, 27	W.	4,458
May	29.710	29.724	29.690	29.708	29.892	22	29.547	31	.345	63.4	87.0	75.6	75.3	104.2	8	48.9	2	55.3	91.1	61.6	.44	.34	19	23	W.	18	SW.	3,942
June	29.653	29.674	29.628	29.652	29.846	14	29.446	25	.400	69.6	93.5	82.1	81.7	113.2	30	58.4	14	54.8	98.2	67.7	[1]—	[1]—	5, 6	20	E.	10	SW.	3,553
July	29.638	29.659	29.609	29.635	29.798	8	29.467	4	.331	79.4	102.1	90.2	90.6	111.6	5	67.8	17	43.8	107.2	77.8	.01	.01	15	30	SE.	1	SE., SW.	4,369
Aug	29.646	29.668	29.629	29.648	29.849	4	29.499	1	.350	79.2	99.2	88.2	88.9	111.6	5	68.5	19	43.1	108.5	77.1	.32	.12	31	30	SE.	15	SW.	4,167
Sept.[3]	29.649	29.674	29.633	29.652	29.909	15	29.352	30	.557	69.7	90.5	79.7	80.0	104.0	20	56.2	8	47.8	94.6	67.8	[1]—	[1]—	1, 13	[4]25	NW.	7	NW.	[4]2,667
Oct	29.729	39.740	29.787	29.735	29.918	27	29.280	1	.638	62.7	82.2	70.3	71.7	99.5	10	49.6	3	49.9	86.8	60.0	[1]—	[1]—	20	32	NW.	18	NE.	3,461
Nov	29.840	29.850	29.838	29.843	30.035	24	29.576	20	.449	53.7	74.6	61.6	63.3	87.3	9	43.1	27	44.2	78.0	51.8	[1]—	[1]—	3, 21	24	NE.	6	NE.	2,757
Dec	29.791	29.808	29.802	29.800	30.211	31	29.464	27	.747	46.6	60.8	51.7	53.0	78.5	1	36.4	11	42.1	63.3	43.5	1.96	.67	9, 10	25	SW.	27	NE.	4,014
Sums	357.060	357.301	356.971	357.111	....	..	....	..	6.429	733.3	968.1	838.1	844.7	.....	...	......	...	554.8	1,010.5	705.5	5.86	....	....	...	....	.....	NE.	[9]47,114
Means	29.755	29.775	29.748	29.759	30.485	[5]1	29.280	[6]1	.536	61.1	80.3	69.8	70.4	113.2	[7]30	34.1	[8]14	46.2	84.2	58.8	.....	....	....	...	....	.....	....	....

[1] Inappreciable.
[2] No observation taken on the 12th.
[3] One 7 a. m. observation missed.
[4] For 24 days only.
[5] January.
[6] October.
[7] June.
[8] February.
[9] For 360 days only.

YUMA, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point. Washington time.				Relative humidity (per cent.). Washington time.				Cloudiness (in tenths). Washington time.				Number of days—								River.											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.		Date.	Lowest.		Date.	Range.		Mean.	
1884.										°	°	°	°																	Ft.	In.		Ft.	In.		Ft.	In.	Ft.	In.
Jan ...	25	22	2	14	4	0	0	15	11	27.3	24.4	30.7	27.5	51.0	25.9	44.9	40.6	3.5	4.4	3.4	3.8	16	10	5	0	0	0	0	0	16	8	2, 3	14	4	17, 18	2	4	15	0.4
Feb....	24	11	1	13	5	2	8	10	13	39.1	36.9	39.3	38.4	66.9	42.2	55.7	54.9	3.2	5.1	4.1	4.1	13	11	5	5	0	0	0	0	21	3	12	14	5	1	6	10	17	9.7
Mar ...	7	5	4	10	8	16	20	11	12	42.1	34.4	40.9	39.1	68.5	31.5	50.8	50.3	3.6	5.5	3.6	4.2	11	13	7	5	0	0	0	0	27	2	11	17	0	27	10	2	19	7.4
Apr....	3	6	5	8	10	15	19	14	7	44.1	39.5	42.5	42.0	64.3	27.7	42.3	44.8	1.8	3.4	2.3	2.5	19	8	2	1	0	0	5	0	20	4	21	17	8	1	2	8	18	7.6
May ...	3	5	5	15	8	22	11	18	6	48.9	41.2	47.2	45.8	61.5	22.0	38.8	40.8	2.1	2.8	2.5	2.5	21	7	3	4	0	0	17	0	26	2	31	18	8	1	7	6	22	1.5
June...	0	3	3	18	9	31	10	9	7	56.4	47.4	54.0	52.6	63.8	21.7	40.2	41.9	2.4	1.8	1.5	1.9	24	5	1	0	0	0	25	0	28	4	26, 27	26	2	1	2	2	27	8.0
July ...	1	4	8	23	9	23	9	11	5	64.5	56.1	64.4	61.7	61.8	23.5	44.2	43.2	1.7	1.6	1.0	1.4	27	4	0	1	0	0	31	0	27	6	13, 14	20	0	30, 31	7	6	24	7.7
Aug ...	4	8	6	15	8	30	5	11	6	66.1	63.4	65.1	64.9	65.7	32.7	48.4	48.9	2.3	3.4	1.7	2.5	22	7	2	5	0	0	31	0	19	8	1, 31	18	2	13	1	6	18	8.7
Sept ...	2	12	9	8	10	17	6	20	5	57.0	50.7	53.4	53.7	67.6	29.5	42.2	46.4	1.0	2.0	1.1	1.4	24	4	1	0	0	0	26	0	19	6	1	15	6	30	4	0	16	6.7
Oct	2	34	7	1	1	13	2	25	8	51.0	51.8	53.1	52.0	68.0	37.6	56.2	53.9	1.6	2.5	1.1	1.7	22	9	0	0	0	0	8	0	16	4	24	14	10	7	1	6	15	3.0
Nov ...	1	50	1	2	1	8	0	14	13	45.7	50.5	47.7	48.0	75.4	44.4	61.4	60.4	.7	2.4	1.0	1.4	23	7	0	0	0	0	0	0	15	10	4	14	1	30	1	9	15	1.1
Dec	6	44	1	7	3	5	0	22	5	40.9	44.2	44.7	43.3	82.1	56.7	78.3	72.4	3.4	5.1	2.4	3.6	15	12	4	9	0	0	0	1	15	9	30	13	5	2, 3	2	4	14	7.2
Sums ..	78	204	52	134	76	182	90	180	98	583.1	540.5	583.0	569.0	796.6	395.4	603.4	598.5	27.3	40.0	25.7	31.0	237	97	30	30	0	0	143	1	......		......	......		......	50	3	225	9.0
	Percentages.																					Percentages.																	
Means .	7.1	18.6	4.8	12.2	6.9	16.6	8.2	16.5	9.0	48.6	45.0	48.6	47.4	66.4	33.0	50.3	49.9	2.3	3.3	2.1	2.6	65.1	26.6	8.2	8.2	0.0	0.0	39.3	0.3	28	4	[1] 26, 27	13	5	[2] 2, 3	4	2.2	18	9.8

[1] June.

[2] December.

NOTE.—7 a. m., 3 p. m. and 11 p. m., Washington time, correspond to 4.30 a. m., 12.30 p. m., and 8.30 p. m., local time.

Correction for instrumental error of barometer used: From 4.30 a. m., January 1, to 3.30 p. m., December 31, 1884, inclusive, −.011 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.150; February, 0.150; March, 0.150; April, 0.150; May, 0.150; June, 0.140; July, 0.140; August, 0.140; September, 0.140; October, 0.140; November, 0.150; December, 0.150.

J. T. BARBER,
Private, Signal Corps, U. S. A.

APPENDIX 53.

DESCRIPTION OF DISTRICTS FOR WHICH INDICATIONS ARE PUBLISHED.

Eastern Gulf States.—Mississippi, Alabama, western Georgia, northwestern Florida, and the portion of Louisiana lying east of the Mississippi river.

Extreme Northwest.—A belt of country about 170 miles broad, extending from Duluth, Minn., to Fort Buford, Dak.

Lower Lakes.—A belt of country about 80 miles wide extending from Lake Champlain to the Indiana state line, including the region south of and adjacent to Lakes Erie and Ontario, and southeastern Michigan.

Middle Atlantic States.—New Jersey, Delaware, the District of Columbia, and the portions of New York, Pennsylvania, Virginia, and Maryland lying east of the Alleghanies.

Middle Pacific Region.—That portion of California west of the Sierra Nevadas and north of the thirty-seventh parallel of latitude.

Middle Plateau.—Western Colorado and those portions of Nevada and Utah lying north of the thirty-seventh parallel of latitude; the southwest corner of Wyoming and the portion of California lying east of the Sierra Nevadas and north of the thirty-seventh parallel of latitude.

Middle Slope.—Eastern Colorado, southwestern Nebraska, western Kansas, northwestern portion of the Indian Territory, a portion of northern Texas, and also of northeastern New Mexico.

Missouri Valley.—A belt of country 200 miles broad, extending southeast from the forty-sixth parallel of latitude to the Arkansas state line.

New England States.—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island.

Northern Slope.—The portions of Montana and Wyoming lying east of the Rocky Mountains, southwestern Dakota, and northwestern Nebraska.

North Pacific Region.—The portions of Oregon and Washington Territory lying west of the Cascade range.

Northern Plateau.—A portion of western Wyoming, western Montana, Idaho, and the portions of Oregon and Washington Territory lying east of the Cascade range.

Ohio Valley and Tennessee.—The belt of country, about 350 miles broad, including Tennessee, Kentucky, southeastern Illinois, southern Indiana, and Ohio, southwestern Pennsylvania, and West Virginia.

Rio Grande Valley.—That portion of southwestern Texas between the Rio Grande and Rio Colorado rivers below the junction of the Rio Pecos with the Rio Grande.

South Atlantic States.—North and South Carolina; the portion of Georgia east of the eighty-fourth meridian, and northeastern Florida.

Southern Slope.—Southeastern New Mexico, central and western Texas.

South Pacific Region.—The portion of California west of the Sierra Nevadas and south of the thirty-seventh parallel of latitude.

Southern Plateau.—Western New Mexico, Arizona, and southeastern California.

Upper Lakes.—Lakes Huron, Michigan, and Superior with adjacent territory.

Upper Mississippi Valley.—The belt of country, about 250 miles broad, between Superior, Wis., and Breckenridge, Minn., on the north, and the Arkansas state line on the south.

Western Gulf States.—Arkansas, the portion of Louisiana west of the Mississippi river, the southeastern portion of Indian Territory, and eastern Texas.

APPENDIX 54.

REPORT ON THE DISPLAY OF COLD-WAVE SIGNALS.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

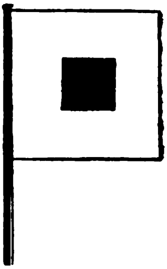
SIR: I have the honor to submit my report upon the work performed in connection with the predictions of cold waves and the display of the cold-wave signal for the year ending June 30, 1885, prefacing the report with a brief history of this recent though important branch of Signal-Service work.

There is scarcely an industry which is not more or less affected by a sudden and marked fall in temperature; and especially is this true of agriculture, stock-farming, cotton-planting, and fruit-shipping. Dealers in perishable goods, packed meats, and many others are also unfavorably affected by unexpected changes in temperature.

This service has long appreciated the value of such information, but it was not until late in 1883 that it was possible to inaugurate the work of giving warnings of the approach of cold waves from twenty-four to forty-eight hours in advance of their appearance.

The plan adopted and now in successful operation is as follows:

Whenever it is anticipated that the temperature will fall suddenly from 15° to 30°, or more, in any section of the United States, the observers in charge of Signal-Service stations in that section are directed, by telegraph, from twenty-four to forty-eight hours in advance, to hoist the cold-wave signal at their stations. The telegrams give the number of degrees that the temperature is expected to fall, and, immediately on their receipt, the observers at the stations selected, display the cold-wave flag from a high staff erected either on the office building, or at some prominent point in the city where the signal is conspicuous and readily seen by the public. The cold-wave signal is a white flag, 6 or 8 feet square, with a black center about 2 feet square. The signal is lowered upon receipt of orders from this office, when it is believed the temperature has reached the minimum. At stations other than Signal-Service stations the signal is lowered twenty-four hours after the order to hoist is received.


Cold-wave signal.

By sending out the warnings in this manner, all persons whose business is liable to be affected by cold weather, or sudden changes in temperature, are enabled to take the precautions necessary by being informed in ample time of the approach of cold waves.

The system of warnings thus inaugurated met with immediate favor throughout the entire country, and the press in most emphatic terms indorsed the efforts made by the service. All branches of agriculture, the railroad companies, extensive fruit dealers, cotton-planters, manufacturers, and others expressed the greatest satisfaction with the system, and in many instances individuals have expended considerable money in order to obtain additional information by telegraph, in the purchase of flags, and in the erection of flag-staffs in towns adjacent to Signal-Service stations.

The railroad and telephone companies have, almost without exception, co-operated with the service in disseminating the information by telegraph and telephone to the cities and stations on their lines. This is done without any expense whatever to the Government, the cold-wave messages sent from this office to the various Signal Service stations being duplicated at those places and sent by the observers to the managers of the railroad and telephone lines for transmission.

All means available are used by the service in giving publicity to the cold-wave warnings, in order that the greatest benefit possible may result from each forecast

The warning is published in the Farmers' Bulletin, in bold type, and thousands of farmers are thus informed of the coming fall in temperature.

A large number of circulars have been prepared and forwarded to the postmasters who receive the information through the Farmers' Bulletin, giving the cost of cold-wave flags and soliciting their co-operation in displaying the signal at their post-offices whenever the warning is published.

Any one not in the vicinity of a Signal Service station can obtain the warnings by paying the cost of telegraphing.

During the present year this system has been greatly improved and extended. The number of stations displaying the signal has been increased and additional facilities employed for disseminating the warnings.

Owing to the very limited appropriations made for the Signal Service, this office has been able to furnish flags only to regular stations of the service and to pay the cost of telegraphing the reports. An annual appropriation of a few thousand dollars would enable the system of cold-wave warnings to be extended over the greater part of the United States, to the benefit of thousands who cannot under existing conditions be brought within the scope of its usefulness.

The following are the instructions governing observers in displaying the cold-wave signal:

The signal is hoisted upon the receipt of a message from this office to "hoist cold-wave signal;" and lowered upon the receipt of the message "cold-wave signal down."

The receipt of orders to hoist or lower cold-wave signals is acknowledged by telegraph thus: "Hoist cold-wave signal received 10 a. m.; cold-wave signal down received 7 p. m." A report by letter is made after each display, stating whether the signal was or was not justified, and giving the maximum and minimum temperatures during the display. This letter also states whether the warning was considered by the business interests and the public generally as being sufficiently in advance to be of decided benefit. Clippings from local newspapers, commenting upon the display, or showing any advantages that may have resulted therefrom, are attached to these letters.

Two copies of Form 112*b* (record of cold-wave signals) are made out each month; one copy is forwarded to this office, the other is filed with the station records.

Observers communicate with the several railroad, telegraph, and canal officials at their stations, furnish them copies of cold-wave orders, and endeavor to secure their co-operation in sending the messages to all points under their control without cost to the United States, as the results of such wide distribution of these dispatches are found to be of great benefit to the general public. Notes are made on Form 112*b* showing the names of persons, firms, and companies to which each message is given.

Cold-wave signals are not ordered unless a temperature of 45°, or lower, is anticipated. When the temperature is expected to fall 20°, or more, in any district, and not reach 45°, a "cool wave approaching" is announced in the indications issued from this office. No signals are displayed for cool waves, nor are cold-wave stations notified in any other manner than through announcement made in the indications. Printing stations give the "cool wave approaching" announcement such prominence as their facilities will permit when it refers to the district in which the printing station is located.

At stations where cautionary signals are displayed, and only one flag-staff is available, the cautionary signal has preference—that is, the cold-wave flag gives way to the cautionary flag under all circumstances.

At stations where no flag-staff is available on the building in which the office is located, the observer endeavors to obtain permission from some one in the vicinity of the office, who has a flag-staff, to use it for displaying the cold-wave flag, without expense to the United States.

Under no conditions are the cold-wave flag and the cautionary signal displayed on the same staff at the same time.

The following is an extract from a letter dated June 26, 1885, from Hon. J. F. Webb, mayor of the city of Lebanon, Ill.:

"I consider the cold-wave signal of more practical benefit to the public at large than any recent improvement in the United States Signal Service. I know, personally, of many instances during the past winter where farmers were saved from serious losses, in the shipment of potatoes and apples, by the timely warning of the cold-wave signal. Other instances I know by report, where losses were sustained in the shipment of live-stock (cattle and hogs) by neglecting or disregarding the warning.

"Our citizens and farmers have learned to rely on the forecasts given, almost implicitly, and it is not too much to say that in my judgment the property saved by its use during the past severe winter in the Mississippi Valley would pay for its maintenance for a generation."

The following extracts are from the reports of our observers, and indicate the importance attached to the cold-wave warnings and their value in leading to the preservation of property.

Albany, N. Y.: "Great reliance is placed on these warnings and much satisfaction is expressed by every one in regard to them. It is difficult to estimate the pecuniary benefits realized." (Letter November 25, 1884.)

"Have furnished warnings to Delaware and Hudson Canal Railroad Company and to the superintendent of canals. The canal company transmit the information over their wires free of charge. The railroad officials seemed much interested in this matter, and offered to do anything that has been done by other companies." (Letter November 25, 1884.)

"All displays during January, 1885, have been justified. This manner of publishing predictions in advance of cold-waves is more popular than through any other course yet adopted. Office is visited by scores of people. Dealers in fruit, oysters, and fish, and the ice companies are specially interested." (Form 112*b*, January, 1885.)

"The interest in these warnings is constantly increasing." (Form 112*b*, March, 1885.)

Atlanta, Ga.: "The following railroad companies send the warnings to points on their roads, namely: Richmond and Danville, the Western and Atlantic, Central, Atlanta and West Point, and Georgia Pacific." (Letters November 26, 1884, and January 13, 1885.)

Auburn, Ala.: "These signals are of great benefit to physicians, gardeners, farmers, and grocers." (Form 112*b*, December, 1884.)

"All cold-wave predictions this winter have been verified. The people have been greatly interested." (Form 112*b*, March, 1885.)

Bangor, Me.: "Signals are of great benefit to persons engaged in storing ice." (Form 112*b*, January, 1885.)

Baltimore, Md.: "Arrangements have been made for furnishing copies of the orders to the Baltimore and Ohio Telegraph and Railroad, Western Union, and Bankers' and Merchants' Telegraph Companies. The officials state that they will give the information the widest publicity possible through their numerous offices in this city." (Letter November 3, 1884.)

"The importers of tropical fruits realize great benefit from the warnings, as they are enabled to protect their fruits on the wharves, and in exposed places, also during transit on the cars to distant points. The oyster-packers are also greatly benefited as, on notice being given of the approach of a cold-wave, they make large shipments of oysters to western cities, where they are readily sold." (Letter November 25, 1884.)

Buffalo, N. Y.: "Cold-wave orders are sent to all telephone, telegraph, and railroad officials, and by them distributed over their several sections. The orders are also published in every paper printed in Buffalo." (Letter November 2, 1884.)

"Produce dealers receive much benefit from these warnings and state that goods are shipped on the strength of Signal Service reports." (Letter November 19, 1884.)

"All the cold-wave signals displayed during January gave general satisfaction to the public, and are considered by the press and public as the best information issued by the Service." (Form 112*b*, January, 1885.)

"Produce merchants, roofers, fish and ice dealers, express companies, &c., acknowledge great service rendered by the displays." (Form 112*b*, March, 1885.)

Boston, Mass.: "The following railroads will send these warnings to the stations along their roads, viz: Old Colony; New York and New England; Boston and Maine; Boston and Lowell; and Eastern." (Letter November 15, 1884.)

Cairo, Ill.: "The following railroads transmit the warnings over their wires to points on their roads, viz: Illinois Central; Wabash, Saint Louis and Pacific; Mobile and Ohio; Iron Mountain; and Texas and Saint Louis narrow gauge." (Letter December 13, 1884.)

"The display of December 15–19, 1884, resulted in saving four car-loads of perishable stuff; the steamers of the Anchor Line were telegraphed and sought good harbors; and a number of valuable tropical animals belonging to a menagerie were comfortably housed." (Letter December 21, 1884.)

"Farmers and dealers in perishable stuffs saved goods valued in all at $3,400." (Form 112*b*, March, 1885.)

Chicago, Ill.: "The following railroad companies will send the warnings, viz: Chicago and Alton; Chicago and Grand Trunk; Chicago, Rock Island and Pacific, and Chicago and Eastern. The Baltimore and Ohio Telegraph Company will also send them." (Letter November 27, 1884.)

Cleveland, Ohio: "The following railroad companies transmit the warnings over their lines, viz: Cleveland, Columbus, Cincinnati and Indianapolis; New York, Portland and Ogdensburg; Lake Shore and Michigan Southern; New York, Chicago and Saint Louis." (Letter November 26, 1884.)

"The service has been very accurate in these warnings. The public now have unbounded confidence in the weather department. The observer is often consulted by interested parties and great benefit is derived." (Form 112*b*, February, 1885.)

Chattanooga, Tenn.: "The Western and Atlantic and the Georgia division East Tennessee and Virginia Railroad Companies will adopt any feasible plan for distributing the cold-wave information over their lines." (Letter November 27, 1884.)

"Displays are watched with interest and acted upon by the public." (Form 112*b*, November, 1884.)

"Farmers across the Tennessee river look for the warnings and will request the county court to expend $50 for additional flag-staff." (Form 112*b*, January, 1885.)

Cincinnati, Ohio: "Warnings will be telegraphed by the following railroad companies to all stations on their roads, viz: Cincinnati, New Orleans and Texas Pacific; Cincinnati, Indianapolis, Saint Louis and Chicago; Cincinnati, Louisville and Nashville; Cleveland, Columbus, Cincinnati and Indianapolis; Cincinnati, Washington and Baltimore; Pittsburg, Cincinnati and Saint Louis, and the Ohio and Mississippi." (Letter November 8, 1884.)

"Produce and fruit merchants, florists and gardeners much interested." (Forms 112*b*, November, 1884, and March, 1885.)

Columbus, Ohio: "Signals are watched closely by the public and business men, and the warnings are received with great favor." (Forms 112*b*, November and December, 1884.)

Davenport, Iowa: "The following railroad companies will promptly send the warnings to all places under their control, viz: Chicago, Rock Island and Pacific; Chicago, Burlington and Quincy; Chicago, Milwaukee and Saint Paul. They will also be sent by the Western Union Telegraph Company. The manager of the Chicago, Rock Island and Pacific has consented to attach a flag, similar to the cold-wave flag, to all express trains on this division of the road." (Letter December 4, 1884.)

Des Moines, Iowa: "Arrangements are completed with the manager of the telegraph company to transmit cold-wave warnings over all the wires from his office. This includes the wires of the several railroad companies." (Letter November 28, 1884.)

"The warning of December 30, 1884, enabled the railroad companies to save about all of their perishable freight." (Letter January 3, 1885.)

"Warnings are of great value to the railroad officials and to shippers of perishable goods." (Form 112*b*, January, 1885.)

Detroit, Mich.: "The newspapers spread the information throughout the State; commission merchants show great interest in the signal; the service can congratulate itself upon the success that has attended the display of cold-wave signals at this station." (Letter October 23, 1884.)

"The Board of Trade is highly pleased with the success of this signal in Detroit. Telephone calls are received daily from Pontiac and Almont, Mich., during cold snaps, relative to the weather. The signal fills a long felt want. The Detroit, Lansing and Northern Railway will transmit all cold-wave warnings over their wires." (Letter November 19, 1884.)

"Mr. A. H. Boies, Hudson, Mich., states that he has nearly completed arrangements for the display of cold-wave signals by establishing a circuit of flag-poles among the farmers for miles around, using his station as a central point for disseminating the warnings. The warnings are sent from Detroit by telegraph to Mr. Boies." (Letter May 21, 1885.)

Galveston, Tex.: "The observer has made arrangements with the various railroad companies and the press by which the warnings are given general circulation." (Letter November 15, 1884.)

Greencastle, Ind.: "Warnings are beneficial to all classes. The displays have led to great interest in weather changes and study of meteorological reports by the people." (Forms 112*b*, November, 1884, and February, 1885.)

Jacksonville, Fla.: The meteorological committee state that "the establishment of the cold-wave warning signal at Jacksonville is highly appreciated by the board of trade and by the citizens of Florida generally." (Letter December 3, 1884.)

"Warnings are beneficial to fruit and vegetable growers. Fires are built in groves in the vicinity for the protection of fruit, &c." (Form 112*b*, December, 1884.)

Keokuk, Iowa: "Warnings are sent over the lines of the Saint Louis, Keokuk and Northwestern Railroad and the Chicago, Rock Island and Pacific Railroad." (Letter November 27, 1884.)

"The Chicago, Rock Island and Pacific Railroad Company contemplate carrying miniature cold-wave flags on all their passenger trains leaving Keokuk. If done, this will give the warnings great publicity." (Letter December 14, 1884.)

"Railroad and ice companies, fruit-dealers, and shippers of potatoes, especially benefited." (Forms 112*b*, January and February, 1885.)

Leavenworth, Kans.: "Warnings will be promptly transmitted to all points on the Chicago, Rock Island and Pacific Railroad, and the Kansas Central Division Union Pacific Railroad." (Letter November 26, 1884.)

"Every signal display during January, 1885, was decidedly useful to the business interests in this vicinity, and the public generally keep a close lookout for the warnings, and appreciate them." (Form 112*b*, January, 1885.)

Little Rock, Ark.: "The reports are furnished the chief operators Memphis and Little Rock Railroad; Fort Smith and Little Rock Railroad; Little Rock, Mississippi River and Texas, and the Saint Louis, Iron Mountain and Southern Railroad, who send them to every operator along the lines, with instructions to make the information as public as possible.

The railroad companies give hearty support to anything which tends to improve crops or the condition of the country." (Letter November 16, 1884.)

Logansport, Ind.: "The cold-wave warnings are of vast benefit to the farmers and citizens here. Hundreds read the 'Farmers' Bulletin.' Both the press and public are pleased that these warnings are given. The signals have brought the service and its workings prominently before our people. As soon as the flag is raised here the trainmen inform the small offices along the road, and thus the flags at these stations are raised within an hour or so after the one here. Adjacent towns receive telegrams at their own expense." (Forms 112*b*, October and November, 1884, January and February, 1885.)

Louisville, Ky.: "Copies of cold-wave warnings are furnished the Ohio Valley Telephone Company; Chesapeake, Ohio and Southwest, and Louisville and Nashville Railroads and will be transmitted over their lines to 108 points in Kentucky, Tennessee, and Indiana. There are 96 railroad and 12 telephone stations." (Letter November 4, 1884.)

Milwaukee, Wis.: "The cold-wave displays are greatly appreciated by commission and railroad men. A great amount of property has been saved by the warnings." (Letter December 21, 1884.)

"The general superintendent Chicago, Milwaukee and Saint Paul Railway states 'This is the kind of information I am always glad to get; please let me have such at any time, for it will be of advantage to us, and will keep the people along our lines posted.'" (Letter October 22, 1884.)

Memphis, Tenn.: "Cold-wave warnings are telegraphed by the following railroad companies to stations along their lines, viz: Memphis and Charleston; Chesapeake, Ohio and Southwestern, and Louisville and Nashville. The Telephone Exchange and Pacific Express Company also send the messages to all stations on their lines." (Letter November 24, 1884.)

"Displays are beneficial to farmers, river men, business men, horticulturists, and shippers of produce." (Forms 112*b*, January and February, 1885.)

Nashville, Tenn.: "Secretary Baker, of the Cumberland Telephone Exchange, repeats cold-wave warnings to 87 towns in Tennessee and Kentucky." (Letter December 4, 1884.)

"Copies of warnings are delivered to the superintendent Louisville and Nashville Railroad, president Nashville, Chattanooga and Saint Louis Railroad, manager Western Union Telegraph office, Nashville. These gentlemen express themselves as more than grateful for these advantages." (Letter November 7, 1884.)

Additional cold-wave flags are displayed from the Capitol building and the Penitentiary at Nashville; Menees & Patton's drug store, Springfield, Tenn.; J. W. Wallace's office, Shelbyville, Tenn.; Prewitt & Co's. mill, the buildings of the National Manufacturing Company, and the Southern Pump Company, in Nashville, and at Mr. J. H. Jordan's house, 7 miles from Nasnville. (Form 112*b*, February, 1885.)

"The mayor of Gallatin, Tenn., contemplates the erection of a flag-staff for the display of cold-wave signals, and it is learned that other towns within a radius of 90 miles of Nashville intend to do the same." (Letter December 23, 1884.)

New Haven, Conn.: The chairman of the meteorological committee Chamber of Commerce, in letter of February 2, 1885, states: "The cold-wave signal recently added has proven and will continue to prove of great value, not only to our market gardeners, nurserymen, and florists, but to a very large industry, viz: The oyster trade, as it gives those engaged in it warnings of the changes in temperature, consequently the best time to manipulate the products of their trade. This industry has of late years become of great value, as in the waters of Long Island Sound, on the Connecticut shore contiguous to us, there are over 4,500 acres under oyster cultivation which, in the near future, will represent an interest of millions of dollars."

New Orleans, La.: "Cold-wave warnings are sent to all the principal points reached by the Western Union Telegraph Company in Louisiana; all the larger towns on the Texas and Pacific Railroad; all along the line of the Morgan's Louisiana and Texas Railroad; the Ocean Tow-boat Telegraph line transmits all order to Port Eads and Point a la Haché; the two Lance Coast Packet boats carry flags for the benefit of sugar planters along the lower coast." (Letter November 29, 1884.)

New York City, N. Y.: "Cold-wave signals have met with universal favor and are deemed of particular value by the members of the different exchanges." (Letter October 16, 1884.)

"Warnings are telegraphed over the New York, Ontario and Western Railroad lines. Arrangements have been made by which all the exchanges, principal business houses, theaters, clubs, hotels, &c., in New York, Brooklyn, and Jersey City are advised of the approach of cold waves within a few minutes of the receipt of the orders. The New York Central and Hudson River Railroad and the New York, West Shore and Buffalo Railroad also receive the information." (Letters November 11 and December 3, 1884.)

Norfolk, Va.: On June 9, 1885, the general manager Norfolk Southern Railroad Company issued the following order:

"From July 1 proximo the United States Signal Service warnings of the approach of cold waves indicating a fall of temperature below 45° will be announced from Berkley to telegraph stations on line of this railroad. Operators at those stations will forward the warnings to Centreville, Shawborough, Okisko, Hickory Ground, Camden Court House, and Windfall by the first train.

"On receipt of the warnings, agents will immediately display the cold-wave signal, a white flag with black centre, from the flag-staff on the station platforms, and keep it displayed for the number of hours mentioned in the order, when it should be lowered unless a second warning is received.

"Operators will duplicate the order, as received, for distribution to above-named stations; and agents will post the same at all stations where received.

"The warnings will be given from twenty-four to forty-eight hours in advance of the cold wave, and will indicate probable duration and fall of temperature.

"In this matter the railroad company co-operates with the United States Signal Service for the benefit of agricultural interests along the road; and agents will be expected to make every effort to give the undertaking practical effect."

Philadelphia, Pa.: "Warnings are of benefit to vegetable and fruit shippers and oystermen, and have become almost indispensable." (Form 112*b*, March, 1885, and letter April 4, 1885.)

Rochester, N. Y.: "The benefits derived from these warnings are very general to all classes. Shippers of perishable produce and dealers in fresh meats are greatly benefited. The warnings are duplicated by flag at Richmond Mills (8 miles south of city) and give great satisfaction to the farmers and millers in that vicinity." (Forms 112*b*, December, 1884, and January, 1885.

Shreveport, La.: "Warnings are telegraphed over the Texas and Pacific Railroad, and the New Orleans Pacific Railroad." (Letter December 17, 1884.)

"Of great benefit to dealers in fruit and produce and there is a feeling of much satisfaction and interest in the cold-wave signals at this point." (Letter December 18, 1884.)

"The display of December 16, 1884, resulted in saving $3,500 worth of goods." (Letter December 19, 1884.)

"The telephone companies co-operate in distributing the warnings to neighboring towns." (Letter January 13, 1885.)

Toledo, Ohio: "The following railroads and telegraph companies have promised hearty co-operation in distributing the cold-wave warnings, viz: Lake Shore and Michigan Southern; Dayton and Michigan; Columbus, Hocking Valley and Toledo; Toledo and Ann Arbor; Pennsylvania and Northwestern Ohio; Toledo, Cincinnati and Saint Louis; Wheeling and Lake Erie; Ohio Central; Toledo and Indianapolis; Michigan and Ohio; Western Union, and Bankers and Merchants' Telegraph companies." (Letter November 27, 1884.)

"Arrangements will be made by which the warnings will reach more than 200 towns in Ohio, Michigan and Indiana." (Form 112*b*, November, 1884.)

Pittsburg, Pa.: "Warnings are telegraphed over the lines of the Allegheny Valley Railroad and the Pittsburg division Baltimore and Ohio Railroad." (Letters November 19, 1884, and December 6, 1884.)

"Great interest is manifested by the public. During displays visitors are almost continuously in the office after information. Shippers of goods, coal and river men, and people in all avocations, are interested in these warnings." (Form 112*b*, January, 1885.)

Saint Louis, Mo.: "Warnings will be sent to all stations on the following roads, viz: Saint Louis and San Francisco; Louisville and Nashville; Saint Louis and Cairo; Wabash, Saint Louis and Pacific; and Saint Louis, Keokuk and Northern." (Letter November 15, 1884, local records December, 1884, and January, 1885.)

"Warnings during January were of extraordinary value to the merchants, railroads, and farmers in this section of the country. Many inquiries were made by merchants and at the exchanges and much valuable information was given." (Form 112*b*, January, 1885.)

"The warnings are of special benefit to gardeners, roofers, dealers in oysters, fruit, and vegetables, farmers, ice-packers, railroads, and dealers in live stock." (Forms 112*b*, November and December, 1884, and February, 1885.)

Washington, D. C.: Warnings are telegraphed over the lines of the following railroads, viz: Baltimore and Potomac; Alexandria and Fredericksburg; Pope's Creek; Washington, Ohio and Western; Chesapeake and Ohio; and Virginia Midland; also over the telegraph lines of the Chesapeake and Ohio Canal Company. The Chesapeake and Potomac Telephone Company send all cold-wave messages over their lines to Frederick, Hagerstown, Westminster, and Baltimore, and from these cities to all connecting points in Frederick, Carroll, and Baltimore Counties. Whenever cold waves are expected to occur in the sections traversed by the Baltimore and Ohio Railroad, warnings of their approach are telegraphed to Superintendent Selden, Baltimore; General Superintendent Zeublin, Chicago; and Superintendent Leslie, New York City. The following are the States included in this system: New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, and Kentucky. (Letters November 14, November 29, and December 29, 1884.)

Whenever cold-wave signals are ordered for Washington notification of the fact is telegraphed to Messrs. W. S. Meyer & Bro., Westminister, Maryland. (Instructions September 18, 1884.)

The following is a list of the regular Signal Service stations at which the cold-wave signal is displayed:

Name of station.	Established.	Name of station.	Established.
Albany, N. Y	Mar. 28, 1884	Leavenworth, Kans	July 30, 1884
Atlanta, Ga	Nov. 6, 1884	Little Rock, Ark	May 17, 1884
Augusta, Ga*	Apr. 4, 1885	Logansport, Ind	July 30, 1884
Bangor, Me	July 30, 1884	Louisville, Ky	Dec. 26, 1883
Buffalo, N. Y	Mar. 8, 1884	Lynchburg, Va*	Apr 4, 1885
Boston, Mass	July 30, 1884	Memphis, Tenn	Oct. 17, 1884
Burlington, Iowa	July 30, 1884	Milwaukee, Wis	Nov. 6, 1884
Baltimore, Md	Sept. 20, 1884	Montgomery, Ala	Nov. 19, 1884
Chattanooga, Tenn	Mar. 21, 1884	Nashville, Tenn	Dec. 26, 1883
Chicago, Ill	Dec. 26, 1883	New York City, N. Y	July 30, 1884
Cincinnati, Ohio	Dec. 26, 1883	New Haven, Conn	Nov. 6, 1884
Columbus, Ohio	July 23, 1884	New London, Conn*	Apr. 4, 1885
Concordia, Kans*	Apr. 4, 1885	New Orleans, La	Nov. 6, 1884
Cleveland, Ohio	Nov. 6, 1884	Norfolk, Va*	Apr. 4, 1885
Cairo, Ill	Nov. 12, 1884	Omaha, Nebr*	Apr. 4, 1885
Charlotte, N. C	Jan. 27, 1885	Philadelphia, Pa	July 30, 1884
Charleston, S. C*	Apr. 4, 1885	Pittsburg, Pa	July 23, 1884
Des Moines, Iowa	July 30, 1884	Portland, Me*	Apr. 4, 1885
Detroit, Mich	July 30, 1884	Rochester, N. Y	Nov. 6, 1884
Davenport, Iowa	Nov. 6, 1884	Springfield, Ill	July 23, 1884
Denver, Colo*	Apr. 4, 1885	Saint Louis, Mo	Dec. 26, 1883
Dodge City, Kans*	Apr. 4, 1885	Saint Paul, Minn*	Apr. 4, 1885
Dubuque, Iowa*	Apr. 4, 1885	Shreveport, La	Nov. 19, 1884
Greencastle, Ind	July 23, 1884	Sandusky, Ohio*	Apr. 4, 1885
Galveston, Tex	Oct. 17, 1884	Savannah, Ga*	Apr. 4, 1885
Grand Haven, Mich*	Apr. 4, 1885	Toledo, Ohio	Nov. 6, 1884
Indianapolis, Ind	July 23, 1864	Vicksburg, Miss*	Apr. 4, 1885
Jacksonville, Fla.	Nov. 6, 1884	Washington, D. C	July 30, 1884
Keokuk, Iowa	Nov. 6, 1884	Wilmington, N. C*	Apr. 4, 1885
Knoxville, Tenn*	Apr. 4. 1885		

*To take effect on and after July 1, 1885.

The cold-wave signal is also displayed in the following cities:

Name.	Established.	Name.	Established.
Auburn, Ala	Sept. 20, 1884	Richmond, Va.	June 6, 1885
Kansas City, Mo	Feb. 13, 1884	Westminster, Md	Sept. 18, 1884
Madison, Wis	Feb. 11, 1885		

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 55.

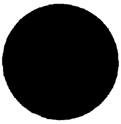
REPORT UPON THE WEATHER AND TEMPERATURE SIGNALS.

SIGNAL OFFICE, *Washington, D. C.*, *June* 30, 1885.

SIR: I have the honor to make the following report upon the weather and temperature signals in use by this Service and State weather services:

The Chief Signal Officer being very frequently called upon by persons interested in weather and temperature changes, who have no means of obtaining the information, to furnish them the indications for the ensuing twenty-four hours, a plan has been adopted by which, through the co-operation of a number of railroads, the State weather services of Alabama and Ohio, and the citizens of certain towns, the indications of the weather and temperature for specific localities are given the public in the form of signals that are displayed on railway trains, at railway stations, and on flag-staffs erected in small towns.

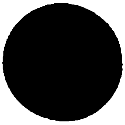
The following is the list of weather and temperature signals adopted and in use by the Signal Service:



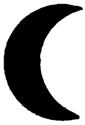
No. 1.—Large red sun, indicates "higher temperature" or warmer weather.

No. 2.—Red crescent, indicates "lower temperature" or colder weather.

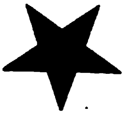
No. 3.—Red star, indicates "stationary temperature."



No. 4.—Large blue sun, indicates "general rain (or snow)."



No. 5.—Blue crescent, indicates "clear or fair weather."



No. 6.—Blue star, indicates "local rain (or snow)."

These signals are used in two forms, the first being six flags, not less than 6 feet square, having the symbols in the center on white ground; and the second consisting of sheet-iron plates, about 3 feet in diameter, on which are painted the colors that denote the signals. The flags are displayed from staffs erected at railway stations, in cities, small towns, &c., and the sheet-iron plates are attached to railway trains.

The system of signals above described is also in use by the Ohio State weather service.

The Alabama State weather service has adopted a different system of flag signals for use in that State, but the weather and temperature indications which these signals denote are almost identical with the Signal Service and Ohio State weather service system.

There are prepared at this office each night special forecasts of the weather for the succeeding twenty-four hours for the States of Alabama and Ohio, and for the regions traversed by railroads that have adopted this system of signals.

These special forecasts are telegraphed from this office to the directors of the Alabama and Ohio State weather services, to General J. F. Boyd, superintendent Cumberland Valley Railroad, to the superintendent of the Frederick division of the Pennsylvania Railroad, and others hereinafter mentioned.

The secretary of the New England Meteorological Society, at Cambridge, Mass., receives the indications from the Signal Service observer at Boston, Mass., to whom they are sent by this office.

Upon the receipt of the indications sent out by this office, the directors of the Alabama and Ohio State weather services and of the New England weather service immediately telegraph them to the superintendents of the various railway companies in their respective States that co-operate in the display of these signals.

The superintendents promptly distribute the information along their lines, and the signals which indicate the coming weather changes are displayed at an early hour, either at the railway stations or from railway trains.

Farmers, merchants, and the public generally along the lines of the railroads are informed by means of these signals as to the weather probabilities for the day, and they are thus enabled to take such precautions and to make such arrangements as the weather indications suggest are for their interest.

The superintendent of the Cumberland Valley Railroad and the superintendent of the Frederick division of the Pennsylvania Railroad receive the indications soon after midnight. The morning trains on these lines carry the proper symbols displayed on the baggage cars.

During the year this Service has endeavored to extend the system of weather and temperature signals, and all means that were available have been used to attain this result; but, owing to the fact that no appropriations have been made for the purpose, efforts in this direction have been greatly crippled, and this office has been unable to furnish the necessary signal flags to indicate probable weather conditions.

On May 14, 1885, 10,000 circulars were printed. A full description of each flag signal, with colored illustration, was given; also the price at which the full set of signals could be obtained, and the names and addresses of the manufacturers who would furnish them.

These circulars have been widely distributed among those who are interested in and receive benefit from weather predictions, and they have been informed that, as the weather indications are telegraphed daily to a large number of the stations of this service, to railroads, post-offices, &c., there are many small towns which could, by proper arrangement, obtain them by telephone or otherwise from the Signal Service stations, railroad stations, or post-offices receiving the reports and displaying the flags; also that the system is now in successful operation at various places, and could, by a little exertion and a small outlay for flags on the part of those who would be benefited, be extended indefinitely, and become one of the most valuable aids to the farmer, the merchant, and the public generally.

Correspondence has also been held with a number of railroad companies with a view to establishing this system on their lines.

It is gratifying to state that the efforts in this direction have met with considerable success, as will be shown in the following outline of what has been accomplished:

This system of signals has been adopted by the Florida Railroad and Navigation Company, and the disks showing the proper signals will be displayed from the baggage cars, beginning July 1, 1885. This company operates 540 miles of railroad and several steamers in Florida. The observer at Jacksonville will superintend the display of signals and take measures to have them properly understood. The special indications for Northern Florida are sent from this office at 1 a. m. daily.

The flag system of signals has been adopted by the Board of Trade of Albany, N. Y. The flags are displayed daily, from a staff on the signal office, and give the greatest satisfaction to the public.

The "Albany and New York day line of steamers" display the flag signals on their boats from Albany south to Poughkeepsie, and from New York City north to Poughkeepsie. The special 1 a. m. indications for Albany and vicinity and for New York and vicinity are furnished daily to this line of steamers by the observers at Albany and New York.

At Troy, N. Y., Messrs. E. W. Boughton & Co. display the flag signals at the expense of the firm. Special indications for Albany and vicinity are sent by telephone from the signal office at Albany.

In letter of June 8, 1885, Mr. W. A. Graham, of Fort Gaines, Ga., states that he will have no trouble in providing flags for display of signals at Fort Gaines if the indications are telegraphed daily. Mr. Graham was informed that as soon as he purchases the necessary flags the indications will be sent.

Mr. Frank Ross, at Oil City, Pa., states, in letter of June 5, 1885, that he can procure the funds to purchase flags for display at Oil City; and requests that the observer at Pittsburg be authorized to telegraph the indications daily for that section. He was told that this will be done when he reports that he has the flags.

At Meadville, Pa., the signals are displayed daily by Mr. J. W. H. Reisinger, postmaster. Special indications for Meadville, Pa., and vicinity are telegraphed from this office to Mr. Reisinger at 1 a. m. daily.

In letter of May 14, 1885, Mr. C. Selden, superintendent Baltimore and Ohio Telegraph Company, asks whether the Signal Service will furnish sets of weather and temperature signal flags for display at the principal points and important branch offices of the Baltimore and Ohio Railroad. If the service desires to do this, Mr. Selden thinks he can arrange with the president and general manager to have the signals displayed daily at such offices.

Mr. Selden was informed that this service has not the necessary funds from which to purchase flags, but they can be procured if the Baltimore and Ohio Railroad Company will co-operate by sending the telegrams and furnishing transportation for an observer to visit stations along the line of the road for the purpose of inducing the citizens to purchase the flags. Should this be done weather warnings will be made a special feature of the road, and special forecasts for each State will be made at this office.

Final arrangements have not yet been perfected.

The observer at Toledo, Ohio, in letter of May 28, 1885, states that the Toledo, Cincinnati and Saint Louis, and the Ohio Central Railroads will display the signals.

Special 1 a. m. indications for the vicinity of the Toledo, Cincinnati and Saint Louis Railroad, in Northern Ohio and Eastern Indiana, are telegraphed daily to Mr. N. McKinnon, superintendent of telegraph at Toledo.

Special 1 a. m. indications for the vicinity of this road in Central Illinois and Western Indiana are telegraphed daily to Mr. H. A. Boomer, division superintendent, Charleston, Ill.

Mr. McKinnon states that the messages will be sent to the towns along the road, and if this is not satisfactory, signals will be displayed on the trains.

The observer at Toledo also reports, in letter of June 24, 1885, that the officials of the Ann Arbor and Northern Michigan Railroad have promised to display the signals on their trains as soon as the road is completed to Mount Pleasant, Mich., which will be in a month or two.

The observer at Shreveport, La., in letter of June 20, 1885, states that the merchants are deeply interested in the subject of weather and temperature signals, and intend purchasing a set of flags for display on the signal office flag-staff.

The observer at Leavenworth, Kans., in letter of June 20, 1885, states that the display of signals on the Kansas Central Railway began June 20, 1885. The adoption of this system of signals by this road is due to the perseverence and energy of Dr. R. J. Brown, chairman of the meteorological committee of the Leavenworth Board of Trade, and to the efforts of the observer. Flags cannot be used to advantage, owing to the obstructions offered by two bridges, and the superintendent of the road has had an ornamental and well-arranged set of disks painted on white surfaces of steel, to be fixed in grooved slats placed on each side of the baggage-cars. Trains displaying these signals run between Leavenworth and Miltonville, a distance of 166 miles, and decided interest is manifested in them by the public.

Special indications for Kansas, Indian Territory, and Western Missouri are sent daily at 1 a. m. to the observer at Leavenworth, Kans.

The observer at Indianapolis, Ind., in letter of April 27, 1885, reports that Mr. Joseph W. Sherwood, superintendent Cincinnati, Indianapolis, Saint Louis and Chicago Railroad, desires to display signals on his trains as soon as arrangements can be made. The observer was informed as to the kind of signals to use, and directed to notify Mr. Sherwood that special predictions for the region of his road will be sent him if he adopts the system.

Weather and temperature signals are displayed daily at Bristol, R. I., and at Watertown, N. Y., by interested persons.

In letter of June 25, 1885, the observer at Toledo, Ohio, forwarded a communication from Mr. T. M. Peelar, superintendent Ohio Central Railroad, requesting that the 1 a. m. indications be sent him. Mr. Peelar was informed that a telegram designating the proper flags to be displayed at stations on the Ohio Central Railroad will be sent him at Bucyrus, Ohio, at 1 a. m. daily. He was also sent circulars to be used in translating messages, if he desires only to bulletin the indications at stations on the line.

It is apparent that this method of announcing weather changes has been received with great favor by the public, and that the information given is of value to a large number of persons. This is abundantly shown by the hearty indorsement that the system has met with wherever it has been introduced.

It is hoped that these signals will, in the near future, be displayed in many towns where the residents have no means at present of obtaining information as to probable weather changes.

The simplicity and utility of the system cannot fail to commend it to every person who realizes the importance of a foreknowledge of the weather.

It is only necessary that the signal flags be purchased (the cost of the entire set ranging from $16 to $21) and that some public-spirited citizen devote a few minutes' time each day to displaying the proper signal, or signals, on a flag-staff in a prominent position near the center of the town. The indications for the locality can be sent from this office each day at a cost of 20 cents, or they can possibly be received from a neighboring Signal-Service station, or railway station, by telephone or telegraph. By these means an entire community can be benefited at a very small outlay.

The co-operation of a greater number of railroads is also desired, as it has been found that the display of these signals from railway trains and at railway stations has been productive of the best results.

The following is quoted from an interesting article on the Ohio meteorological bureau, written by Prof. T. C. Mendenhall, director of the Ohio State weather service, and published in the American Meteorological Journal, May, 1884:

"One of the most important undertakings of the bureau has been the establishment of a system of railway signals, by means of which people in the neighborhood of a railway line could be notified of the weather probabilities of the day in accordance with the predictions received from Washington. The first report issued by the bureau contained a reference to the proposed scheme, which had been suggested by Mr. M. R. Tracy, of Latchie, Ohio.

"In the spring of 1883 one of the railroads connecting Columbus with Cleveland (the Cleveland, Mount Vernon and Delaware Railroad) consented to undertake the experiment, offering to bear the expenses necessary in equipping the cars with the necessary signals. The subject of the most suitable system of signals received careful consideration. It was important that those selected should be at once simple, easily interpreted, and of such character as to be readily distinguished at a considerable distance. It was determined to confine the predictions, for the present at least, to forecasts of temperature and the state of the weather as to precipitation. Three forms were chosen, called by the familiar names sun, moon, and star. These are shown in two colors, red and blue. The red signals refer to temperature and the blue to rainfall. The sun, a round disk nearly 3 feet in diameter, is understood to mean a probable rise in temperature if red, or a general rain if blue. The moon, a crescent, means falling temperature if red, and clear or fair weather if blue. The star, five-pointed, means stationary temperature if red, and local rains if blue.

"Experience has shown that these signals are admirably adapted to the service to which they have been put, being easily distinguished from each other and instantly interpreted after a little practice.

"The Chief of the United States Signal Service, General Hazen, has generously co-operated with the bureau to secure the success of the experiment. Special telegrams have been sent, using the language of the signals, for the region of country traversed by the road. The trains bearing these signals on the baggage cars leave a point near the middle of the line about 5 o'clock a. m., thus bringing the forecast to the attention of residents along the line at an early hour. Verification observers have been appointed at nearly every station along the route, and thus far the predictions have been found correct in 85 cases in 100. The want of one or two additional signals has been felt for occasional use in forecasting extraordinary changes, such as extreme cold, violent winds, &c. The matter is receiving consideration, but no selection of such signals has been made. The Bureau has furnished models of these signals to several persons interested in this work who are making efforts to have them placed on roads in other States, and it is intended to extend the system in Ohio during the present year (1884)."

In connection with my report on this subject I have the honor to submit also the reports made by Prof. P. H. Mell, jr., director of the Alabama State weather service, Mr. E. H. Mark, secretary Ohio meteorological bureau, and Prof. William M. Davis, secretary New England Meteorological Society.

These reports are of special interest, as they indicate the importance attached to weather predictions in Alabama, Ohio, and New England, and also show the extent to which the use of the weather and temperature signals has been carried in these sections through the generous co-operation of railway officials and others:

OHIO METEOROLOGICAL BUREAU,
Columbus, Ohio, June 8, 1885.

DEAR SIR: In reply to yours of the 6th instant, I have the honor to inform you that the railway weather signals are displayed on the Cleveland, Mount Vernon and Delaware, both divisions of the Columbus, Hocking Valley and Toledo, and the Columbus and Cincinnati Midland Railroads. This bureau has charge of all the signals, and keeps a man employed at the Union Depot in Columbus to change the signals on all trains carrying them. The signals are also displayed on the morning trains coming into Columbus.

The predictions are received here in Columbus at about 1 a. m., and are immediately transmitted to the night operator at the telephone office, who transmits them to the telegraph offices at the depot. The night operator also transmits them to the train dispatcher of each of the roads, who immediately telegraphs them to the other end of the road, so that the morning train leaving for Columbus displays the signals. The signals are changed at these points by the baggage-master. On the Cleveland, Mount Vernon and Delaware the telegram containing the signals is sent to Akron, the central office of the road. The superintendent then issues an order to his trainmen in the same manner that all other train orders are issued.

The superintendent of the Cleveland, Mount Vernon and Delaware Railroad is N. Monsarrat, Akron, Ohio. The superintendent of the Columbus, Hocking Valley and Toledo Railroad is G. R. Carr, Columbus, Ohio. The superintendent of the Columbus and Cincinnati Midland Railroad is S. P. Peabody, Columbus, Ohio. The first two named gentlemen have taken great interest in the work, and have done all they could to assist the bureau in carrying on the work.

The number of stations on the Columbus, Hocking Valley and Toledo is about one hundred; on the Cleveland, Mount Vernon and Delaware, thirty-seven; on the Columbus and Cincinnati Midland, thirty.

In addition to the above, many towns display the signals in prominent places, and quite an interest has been worked up in some places. Applications are received frequently from towns not lying on the railroads displaying the signals asking for the signals in their locality. Some of the agricultural societies of the State are anxious to take hold of the system, but the bureau is not able financially to extend the work.

Those sections receiving the signals place great reliance on the predictions as sent out by the Chief Signal Office. The large percentage of verification makes it a reliable source of information.

Hoping that the work may be greatly extended and ready to give any further information that you may desire,

I am, very respectfully, your obedient servant,

E. H. MARK, *Secretary.*

General W. B. HAZEN,
Chief Signal Officer, Washington, D. C.

[State Agricultural and Mechanical College, Department of Natural History and Geology, and Central Office State Weather Service.]

AUBURN, ALA., *June* 16, 1885.

DEAR SIR: I have the honor to acknowledge the receipt of yours of the 6th instant, and send inclosed a list of the railroads displaying signals, their superintendents, the men having charge of the weather service on these various roads, and the stations at which these signals are displayed.

The superintendents of all the roads have taken the matter under their immediate charge, except the Mobile and Montgomery Railroad, the Mobile and Girard Railroad, and the Western Railroad of Alabama.

The weather service on the first two of these roads is under the direction of the chief telegraph railroad operators, while on the last-named road I authorize the operators at the stations to appropriate the message you furnish me each day, which they catch as it passes over the wires. This road has no wires of its own, and the Western Union Telegraph Company will not let the railroad authorities send these telegrams without charge.

The weather indications are received at this office between 6 and 7 o'clock, and are the indications issued from your office at 1 a. m.

The East Tennessee, Virginia and Georgia Railroad does not own its telegraph lines, and the only way to display signals along that road, I found, was to display them from the trains. The schedule on this road enables the signals to reach all parts of the road before 3 p. m. I hope soon to have the signals displayed from the trains on the following roads, viz: The Alabama Great Southern Railroad, the Montgomery and Eufaula Railroad, the Memphis and Charleston Railroad, the Columbus and Western Railroad.

These roads do not own their telegraph lines, and hence the only way to reach the territory is by displaying the signals from the trains for the present.

The following are the railroads, with number of stations on each, that receive the weather signals daily:

Name of railroad.	Superintendents.	Number of stations.	Remarks.
Atlanta and West Point and Western of Alabama.	Cecil Gabbett, Montgomery, Ala.	12	The stations on this road are not furnished by the railroad superintendent, but directly from Auburn, Ala.
South and North	I. Y. Sage, Birmingham, Ala.	9	
Mobile and Montgomery	M. S. Belknap, Montgomery, Ala.	3	Signals are furnished for these stations to Mr. W. Haylow, Montgomery, Ala.
Mobile and Girard	W. L. Clarke, Columbus, Ga.	5	Signals are furnished these stations through Mr. J. A. Roland, railroad telegraph operator, Columbus, Ga.
The Georgia Pacific	Levi Hege, Birmingham, Ala.	11	
East Tennessee, Virginia and Georgia (Alabama Division).	J. M. Bridges, Selma, Ala.	64	
North Eastern, of Georgia.	H. R. Bernard, Athens, Ga.	8	

I am, very respectfully,

P. H. MELL, Jr.,
Director Alabama Weather Service.

The CHIEF SIGNAL OFFICER, *Washington, D. C.*

NEW ENGLAND METEOROLOGICAL SOCIETY,
CAMBRIDGE, MASS., *July* 9, 1885.

CHIEF SIGNAL OFFICER, UNITED STATES ARMY,
Washington, D. C.:

SIR: In reply to your letter of the 6th ultimo, I have the honor to send, inclosed, a list of stations in New England, excepting Connecticut, displaying cold-wave and other weather signals.

The 1 a. m. indications are sent by mail from the Boston Signal Office to the following telephone exchanges:

Haverhill, Lowell, Salem, South Framingham, and Worcester, Mass.; also to G. S. Bass, assistant postmaster, Quincy, Mass. The morning mail reaches these points in time for an early display of flags.

The same indications are telegraphed from Signal Office in Boston to W. H. Childs, Brattleborough, Vt.; Telephone Exchange, Manchester, N. H., and from Signal Office in New Haven, Conn., to Telephone Exchange, Springfield, Mass.

It is from these centers that we hope to display flags and to extend the display to adjoining towns.

* * * * * * *

Where the flags are displayed they are reported to give much satisfaction.

Stations displaying weather flags in New Hampshire, Vermont, Massachusetts, and Rhode Island.

Station.	Number of flags displayed.	Indications used.	Display begun.	Indications furnished by—	Flags furnished by—	Displayed by—
Bedford, Mass	Set of seven	1 and 7 a. m	Feb. —, 1885	Boston Telephone Exchange		Police Department.
Boston, Mass	Cold wave	do	Jan. 20, 1885	Signal Office	Old Colony R. R	Old Colony R. R.
Brattleborough, Vt	Set of seven	1 a. m	Feb. 12, 1885	Telephone from Boston signal office	W. H. Childs	W. H. Childs.
Brockton, Mass	Cold wave	Special	Jan. 20, 1885	Old Colony R. R	Old Colony R. R	Old Colony R. R.
Canton, Mass	Set of seven	1 and 7 a. m	Feb. 26, 1885	Boston Telephone Exchange	T. Owen	T. Owen.
Clinton, Mass	do	1 a. m	Now ready	Worcester Telephone Exchange	Town	Town clerk.
Cochituate, Mass	do	do	do	Framingham Telephone Exchange	Geo. C. Fairbanks	Cochituate Enterprise.
Dedham, Mass*	do	1 and 7 a. m		Boston Telephone Exchange	H. H. McQuillan	Police Department.
East Pepperell, Mass	do	1 a. m	Mar. —, 1885	Worcester and Nashua R. R	G. G. Tarbell	G. G. Tarbell.
Fall River, Mass	Cold wave	Special	Jan. 20, 1885	Old Colony R. R	Old Colony R. R	Old Colony R. R.
Fitchburg, Mass. (a)	do	1 a. m		Fitchburg R. R	J. W. Kimball	J. W. Kimball.
Fitchburg, Mass. (b)	Set of seven	do	Now ready	Fitchburg Telephone Exchange	Vickok & Frost	Vickok & Frost.
Hanover, N. H	do	do	May —, 1885	Telephone from White River Junction, Vt	C. S. Cook	C. S. Cook.
Higham Centre, Mass	do	1 and 7 a. m	Jan. 26, 1885	Old Colony R. R	P. N. Sprague	P. N. Sprague.
Leicester, Mass	do	1 a. m	Apr. —, 1885	Providence and Worcester R. R	J. B. Sargent	J. B. Sargent.
Leominster, Mass	Cold wave	7 a. m		Old Colony R. R	T. A. Hill	T. A. Hill.
Manchester, N. H. (a)	Set of seven	1 a. m	Feb. 4, 1885	Manchester Telephone Exchange	A. Q. Gage	City Government.
Manchester, N. H. (b)	do	do	Feb. —, 1885		McQuade Bros	McQuade Bros.
Marlborough, Mass	do	do	May —, 1885	Old Colony R. R	Pratt Bros	
Medford, Mass	do	1 and 7 a. m	Mar. —, 1885	Boston Telephone Exchange		Police department.
Middleborough, Mass	Cold wave	Special	Jan. 20, 1885	Old Colony R. R	Old Colony R. R	Old Colony R. R.
Milford, N. H	Set of seven	1 a. m	Feb. 18, 1885	Boston and Lowell R. R	J. W. Crosby	J. W. Crosby.
Natick, Mass	do	do	June 1, 1885	Framingham Telephone Exchange	George C. Fairbanks	
New Bedford, Mass	Cold wave	Special	Jan. 20, 1885	Old Colony R. R	Old Colony R. R	Old Colony R. R.
Newport, R. I	do	do	Jan. 20, 1885	do	do	Do.
North Weymouth, Mass	Set of seven	1 and 7 a. m		Boston Telephone Exchange	Improvement Association.	J. R. Orcutt.
Pawtucket, R. I.*	do	1 a. m		Providence and Worcester R. R		H. F. Jenks.
Pittsfield, Mass	do	do	May —, 1885	Housatonic R. R	J. B. Harrison	J. B. Harrison.
Plymouth, Mass	Cold wave	Special	Jan. 20, 1885	Old Colony R. R	Old Colony R. R	Old Colony R. R.
Quincy, Mass. (a)	do	do	Jan. 20, 1885	do	do	Do.
Quincy, Mass. (b)	Set of seven	1 and 7 a. m	Apr. 1, 1885	Boston Signal Office and Old Colony R. R	G. S. Bass	G. S. Bass.
Rock Bottom, Mass	Cold wave	1 a. m	Apr. 4, 1885		J. F. O'Brien	J. F. O'Brien.
Somerset, Mass	do	Special	Jan. 20, 1885	Old Colony R. R	Old Colony R. R	Old Colony R. R.
South Braintree, Mass	do	do	Jan. 20, 1885	do	do	Do.
South Weymouth, Mass	Set of seven	1 and 7 a. m	Mar. 1, 1885	Boston Telephone Exchange	Improvement Association.	H. A. Thomas.
Springfield, Mass.*	do	1 a. m		Standard Time Company	Babbitt & Chapin	
Taunton, Mass. (a)	do	1 and 7 a. m	Feb. 17, 1885	Old Colony R. R	City of Taunton	City of Taunton.
Taunton, Mass. (b)	do	do	Mar. 9, 1885	do	E. U. Jones	Chief of police.
Taunton, Mass. (c)	Cold wave	Special	Jan. 20, 1885	do		
Waltham, Mass	Set of seven	1 and 7 a. m	Mar. 20, 1885	Boston Telephone Exchange	Bradford & Williams	Bradford & Williams.
West Medford, Mass	do	do	Mar. 18, 1885	do	Subscription	F. H. Walker.

* In preparation.

Very respectfully, your obedient servant,

W. M. DAVIS,
Secretary New England Meteorological Society.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The Chief Signal Officer of the Army,
Washington, D. C.

APPENDIX 56.

REPORT ON RAILWAY WEATHER BULLETIN SERVICE.

SIGNAL OFFICE,
Washington, D. C., June 30, 1885.

SIR: I have the honor to make the following report upon the work done by this service in connection with the Railway Weather Bulletin Service during the year ending June 30, 1885:

In arranging for railway bulletins of weather reports, the following points are observed:

This office causes the indications to be furnished at a fixed hour to any railway company volunteering to transmit them over their lines without charge to the United States.

The bulletins are displayed upon bulletin boards, having a heading as follows: "Daily weather report, Signal Service, United States Army. Published by co-operation of the ——— Railway Company and posted for the benefit of agriculture, commerce, and the traveling public."

Each station is supplied by this office with the following articles: One bulletin-board, one district map, one district map frame, Forms 125*a* (monthly report), Forms 126 (railway bulletins), franked envelopes.

The superintendents of the railway companies have the indications telegraphed to all the offices on their roads at as early an hour as practicable after they are open for business, and a copy of the indications, plainly written upon the "railway bulletin," is posted without delay upon the bulletin-board at each railway station.

The time of receiving and time of displaying the indications are noted by the operator on Form 125*a*, which form is forwarded to this office by mail at the end of each month by the operator or manager in charge of the telegraph office at which the indications are received, and a retained copy is kept for reference. Four of the bulletins displayed at the station are forwarded to this office by mail with Form 125*a*, one bulletin for each week included in the report.

Observers in charge of Signal Service stations from which the indications and weather reports are distributed give special attention to this portion of their duties. They see that the reports are furnished to the operator or designated agents of the companies immediately upon their receipt from this office.

They also confer with the officers of the railway companies at their stations and explain that the object of the railway bulletin service is to distribute the information collected at this office, and that the reports may prove of value to the railroads, the traveling public, and to citizens on the lines of the roads.

The railway bulletin system of weather reports is a most valuable adjunct of the Signal Service. Through the co-operation of the many railroad companies that have generously extended their aid without expense to the United States, the indications are daily posted at hundreds of towns, villages, and stations throughout the country, and thus thousands of persons are kept fully informed as to the conditions of the weather and the indications for the succeeding twenty-four hours. These small places on the lines of railroads have no newspapers, and many of them being at a great distance from the principal cities, the large number of people who are interested in and benefited by the weather reports have no means of obtaining the information except through the telegraph offices of the railway companies. It will be readily seen, therefore, that the farmers, fruit-growers, shippers of merchandise, lumbermen, and persons engaged in other industries who are dependent upon this system of publishing the weather reports are deeply interested in its support and extension.

The following extracts from the reports of the inspectors of the railway bulletin service indicate the importance attached to the work done by the Signal Service in this matter:

[From report of the inspection of the weather bulletins posted on the Cincinnati, Washington and Baltimore Railroad, by Sergt. L. Dunne, December, 1884.]

"With a few exceptions I found the indications for the day on which my visit was made, posted on the bulletin-boards. No bureau of the Government is more appreciated than the Signal Service. Although my final instructions of November 25, 1884, did not mention post-offices, yet I made it a point to visit those displaying 'Farmers' Bulletins.' I found the bulletins were promptly posted. Postmasters say that hardly a person enters the office without consulting the bulletin. All speak in flattering terms of the great success attained in weather forecasts. The weather warnings are closely watched."

[From report of stations inspected on the Cleveland, Columbus, Cincinnati and Indianapolis Railroad, by Sergt. William Line, December 13, 1884.]

"The people along the various divisions take great interest in this work, and the indications are of great value to them, I am positive, for during the trip I had an opportunity to see the people and consult them."

[From report of stations inspected on the Flint and Pere Marquette Railroad, by Sergt. N. B. Conger, December 18, 1884.]

"I found the reports posted promptly. They were up to date, and are considered of great value by the railroad company and the citizens of the several towns where they are posted, and the service can be congratulated upon this evident display of interest in the weather reports."

[From report of stations inspected on the Chicago and West Michigan, and Grand Rapids and Indiana Railroads, by Sergt. J. E. Mueller, January 19, 1885.]

"The stations of Newaygo, Casnovia, Kent City, and Sparta Centre are all flourishing lumber towns, and near the southern terminus of the Newaygo branch of the Chicago and West Michigan Railroad; the country abounds in prosperous farms and fruit orchards, the owners of which are greatly interested in the daily bulletins, and derive considerable benefit from their regular display. The agent at Sparta Centre stated that on various occasions when, by accident or want of time, the indications were missed the people would promptly request him to call up the sending station and get them for their information. 'You see from that,' he continued, 'that it would not do here to neglect these reports, for they have taken too strong a foothold in this section of country.' The interest manifested in the reports is gratifying."

[From report of stations inspected on the Allegheny Valley, the Pittsburg, Fort Wayne and Chicago, and the Bellaire, Zanesville, and Cincinnati Railroads, by Sergt. O. D. Stewart, February 17, 1885. Number of stations inspected 117.]

"The general managers and superintendents of telegraph of each of the above-mentioned roads take great interest in these reports, and they not only desire but direct their agents and operators to copy the indications regularly, to give the public every facility to consult them, and to do all they can to aid in their promulgation. The railway bulletin is an important work of the service, as it reaches points too remote to be supplied in any other manner. My tour of inspection included portions of the States of Pennsylvania, Ohio, Indiana, and Illinois. I found the interest varied in different localities, depending largely upon the prevailing occupations of the people, but increasing in all localities. In Ohio a more general interest is manifested than in the other States mentioned. Many of the railroads running through that State carry the railway signals on sides of the baggage cars. These signals are regularly looked for and noted.

"All towns having a population of from 2,000 to 7,000 should receive the indications regularly, and especially have all the cold-wave orders telegraphed to them. In towns of this size there are enough persons sufficiently interested to bear, should it be necessary, the cost of transmitting the warnings."

[From report of stations inspected on the New York and New England Railroad by Private J. P. Slaughter, February [illegible], 1885.]

"Much interest is manifested in predictions at nearly all stations. A large number of persons, both travelers and residents along the road, daily consult these bulletins, and are frequently much benefited by them."

During the year ending June 30, 1885, the railway weather bulletin service has been established on the following-named roads:

Name of railroad.	Number of [illegible]	Name of railroad.	Number of [illegible]
Bellaire, Zanesville and Cincinnati	[illegible]	[illegible]	[illegible]
Ohio River	[illegible]	[illegible]	4
Saint Louis and Cairo	[illegible]	[illegible]	[illegible]
Washington, Ohio and Western	[illegible]	[illegible]	5
Chicago and Alton	[illegible]	[illegible]	
Cleveland, Lorain and Wheeling	[illegible]	[illegible]	[illegible]

The stations posting the indications on the railroads mentioned in the following list have been inspected during the year:

Name of railroad.	Number of stations inspected.	Name of inspector.
New York Central and Hudson River	20	Sergt. J. O. Barnes.
Baltimore and Ohio	71	Sergt. Geo. W. Felger.
Boston and Lowell	13	Sergt. O. B. Cole.
Worcester, Nashua and Rochester	18	Do.
New York and New England	45	Private J. P. Slaughter.
Old Colony	108	Private O. N. Oswell.
Providence and Worcester	13	Sergt. O. B. Cole.
Burlington, Cedar Rapids and Northern	98	Sergt. P. F. Lyons.
Chicago and Northwestern	56	Sergt. T. B. Jennings.
Marietta and Cincinnati	14	Sergt. L. Dunne.
Cleveland, Columbus, Cincinnati and Indianapolis	33	Sergt. William Line.
Grand Rapids and Indiana	81	Sergt. J. E. Mueller. Private S. R. Richey.
Chicago and West Michigan	40	Sergt. J. E. Mueller. Private S. R. Richey.
Detroit, Grand Haven and Milwaukee	4	Sergt. N. B. Conger.
Flint and Pere Marquette	14	Do.
Detroit, Lansing and Northern	21	Do.
New York, Ontario and Western	81	Sergt. J. G. Linsley.
Southern Central	22	Do.
Allegheny Valley	38	Sergt. O. D. Stewart.
Pittsburg, Fort Wayne and Chicago	66	Do.
Bellaire, Zanesville and Cincinnati	13	Do.
Eastern	51	Sergt. G. Liebmann.
Grand Trunk (Yarmouth to Island Pond)	14	Private B. A. Kinney.
Maine Central	11	Do.
Portland and Ogdensburg	12	Sergt. G. Liebmann.
Atchison, Topeka and Santa Fé	88	Private E. M. Philebaum.
Kansas City, Saint Joseph and Council Bluffs	45	Corpl. G. A. Weber.
Philadelphia, Wilmington and Baltimore	37	Sergt. C. N. Kitchel.
Philadelphia and Reading	119	Do.
Northern Central	4	Do.
Philadelphia and Erie	26	Do.
United Railroads of New Jersey	53	Do.
West Jersey	35	Do.
Baltimore and Potomac	4	Do.
Huntingdon and Broad Top Mountain	8	Do.
Cumberland Valley	10	Do.
Memphis and Charleston Division East Tennessee, Virginia and Georgia	7	Sergt. D. T. Flannery.
Pennsylvania	76	Sergt. C. N. Kitchel.

The total number of railway bulletin stations inspected during the year is 1,469.

In addition to those given in the above lists, the following railroads also post the weather bulletins: Boston and Maine, 34 stations; Lehigh Valley, 30 stations; Louisville and Nashville, 20 stations.

The stations on the above-named roads were not inspected this year.

The railway bulletin service was discontinued on the Chicago, Saint Paul, Minneapolis and Omaha Railway October 9, 1884, and on the Burlington, Cedar Rapids and Northern Railway February 25, 1885.

There are fifty-one railroads co-operating with the Signal Service in this important work, and the indications are posted at 1,555 stations along the lines of these roads.

Assuming that upon an average there are twenty-five persons at each of these railway stations who are directly interested in the weather indications, it will be seen that at the total of 1,555 stations there are 38,875 people who are daily benefited by this system of weather reports.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 57.

REPORT ON RIVER AND FLOOD WARNINGS.

SIGNAL OFFICE,
Washington City, June 30, 1885.

SIR: I have the honor to state that the river and flood reports from regular Signal Service and special river stations have been continued throughout the year ending June 30, 1885, as in previous years.

The river system of the United States embraces some of the largest navigable rivers of the world, and the area of country drained by them includes great and fertile tracts of agricultural and mineral lands.

The enormous products of the soil and mines have so stimulated the river commerce that millions of dollars are invested in levees, wharves, dams, shipping, &c.

The frequent disasters to these investments by storms and floods, and the destruction of property resulting from the sudden and unforecasted rises of the rivers, have created a demand for such information as can be used to assist the property owners and the public generally in anticipating the future rise of the rivers to the danger line.

In the absence of storms and floods the interests of the river commerce also demand a knowledge of the water supply in the tributaries of our great rivers, to permit a determination of the future supply of water for purposes of navigation at points where the depth is sometimes insufficient. River observations will indicate the slightest increase or decrease of water in the river caused by recent rains, melting of snow, or drought.

The rise or fall of the water at any point will, as a rule, cause a rise or fall farther down the river. To warn those interested who are located below, the observations are immediately telegraphed down the river to such points as experience has shown are most desirable for the warning of river interests.

At points where meteorological stations of the Signal Service are located, the observers of such stations are charged with taking the river observations. At other points where river observations are desired the observers are selected from the citizens at those points.

The duties required of the special river observers consist of taking and recording observations at stated hours of (1) the depth of the water in the river; (2) the state or condition of the weather; (3) the direction of wind; (4) the amount of rain or snowfall since the last observation; (5) the depth of the snow on the ground. These phenomena, if ordered sent by telegraph, are reduced to a brief cipher telegram, as hereinafter described, and delivered to the local telegraph office for transmission to such points as may be directed by the Chief Signal Officer. If ordered sent by mail, they are not enciphered, but entered on the postal cards or other form furnished the river observer, according to the printed headings thereon, and mailed to their destination.

The data collected in making these observations being for the benefit of the public, special river observers are authorized to furnish such data to any one needing the information.

This branch of the service has been largely increased, and a much greater area of country, affected by the changes in our larger rivers, has been covered. The resulting value of the information furnished business interests has been very great.

On January 1, 1885, the special river stations were arranged in sections and placed in charge of the Signal Service observers at section centers.

With a few exceptions, special river observers receive all instructions from, or through, and render all reports and bills to, the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special stations, and then forward them to this office.

If reports or bills are not received at the section centers within three days after the period at which they are due, they are called for by mail. Any persistent neglect of the special stations in this direction is reported to the Chief Signal Officer with such recommendation as the observer may consider proper to make to improve the service. Defective reports which cannot be remedied at section centers are sent back to the special stations for correction. Section centers make a report to the Chief Signal Officer, on the 15th day of each month, of the reports which are missing for the previous month, giving the probable reason therefor.

In certifying to bills, care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover are received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center: "The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62*a*) and filled out as follows:

"For services rendered as river observer, at ——, for the month of ——, 188—, for —— (give the number of observations), at —— cents per day (or observation)."

When an observation or report has been missed or extra ones are taken the fact is noted on the face of the bill, for example: "No observations taker August 2 and 7." The bill is altered to agree with work done.

Observers in charge of section centers are held responsible for the correctness of all bills certified to by them, and they assure themselves of their accuracy before forwarding them to this office. In no case are reports or bills held at section centers longer than is absolutely necessary to act upon them.

In corresponding with special stations, the observers in charge of section centers exercise proper official courtesy and keep a careful record of the correspondence.

The number of observations to be taken daily is determined by the Chief Signal Officer, or by the observers in charge of centers.

The centers are usually located at some important city where the reports of the special stations in the vicinity can be most advantageously collected and published for the benefit of the river commerce.

On November 19, 1884, instructions were issued in pamphlet form for the guidance of river observers in erecting gauges, taking observations, rendering reports, &c.; also a complete cipher for enciphering reports for telegraphic transmission. These instructions cover the entire field of special river observations. They went into effect on the Tennessee River system December 1, 1884, and at all other special river stations January 1, 1885.

On January 1, 1885, the measurement of the depth of water was changed from feet and inches to feet and tenths of a foot, and all measurements have since been so read, recorded, and published.

Regular river observations are made at 2 p. m., seventy-fifth meridian time, daily; but when a rise in the river is sudden or dangerous, or when special reports are called for by the observer in charge of the section center, as many extra observations are taken as are deemed necessary to keep the public fully informed of the nature and extent of the rise.

Form No. 203 is used for enciphering observations. The form properly filled up is delivered at the telegraph office as soon as possible after taking the observations, and the report is immediately telegraphed to the observer in charge of the center. Upon receipt of the reports from the stations in his center the observer in charge transfers his reports from all stations to Form No. 108 (daily report of stage of water in the twenty-four hours ending at 2 p. m., seventy-fifth meridian time). This form gives the following data: Names of stations making reports; height of river above low water; change in twenty-four hours; direction of wind and state of weather at time of report. Copies of this form are posted in conspicuous places so that they are readily accessible to the public. The information is also published in the daily newspapers. By these means all interests are kept fully informed of the condition of the rivers, and are thus enabled to take the necessary precautions for protecting property.

In cases of sudden and dangerous rises, and of floods, the information which is given promptly during the period of danger is of incalculable benefit to rivermen, vessel-owners, shippers of merchandise, &c., and is doubtless often instrumental in saving lives.

Whenever necessary, reports from adjoining stations are ordered sent to observers at special river stations, and are given by them to the press, and also posted in such public places as are most frequented by persons interested in the condition of the river.

All observations taken during the month are recorded on Form No. 114. One copy of this form is retained at the station, and two copies are sent to the observer in charge of the section center.

The observer at Chattanooga, Tenn., in his report upon the operation of the Tennessee flood system during April, 1885, states:

"There is a growing opinion of the value of the system, both in this community and in places lower down the river supplied with daily bulletins from this center. The lumbermen have been so greatly benefited by the reports, that they are anxious to obtain like information of sudden rises, calculated to bring down timber during other months, and a memorial to this effect is being prepared by them, which will be forwarded."

The observer at Nashville, Tenn., in a report dated March 9, 1885, commenting upon a sudden rise in the Cumberland River, states: "Reckoning in money value all property saved during the rise mentioned, it would more than sustain this river-center for two centuries to come. Also: "The steamboatmen have caused a large bulletin-board, 4 by 6 feet, to be made, at great expense to themselves, whereon is shown daily the river data."

Reports of Western floods were telegraphed during the present season, by special message, to the observer at New Orleans, La., to be by him distributed to the following addresses by messenger, whenever practicable, and to outlying places by telegraph: The Capitolian Advocate, Baton Rouge, La.; W. T. Evans, Vidalia, La.; Thomas Moore, Saint Joseph, La.; M. C. Redmond, Floyd, La.; A. W. Crandall, Tallulah, La.; T. J. Maughan, Rayville, La.; E. M. Coe, Monroe, La.; A. C. McMeans, Bastrop, La.; F. H. G. Taylor, Lake Providence, La.; —— Floyd, postmaster, Delta, La.; L. M. Howard, Coushatta, La.; L. C. Giffe, Alexandria, La.; Louisiana Farmer, New Iberia, La.; Dr. J. P. H. Wise, Morgan City, La.; Maj. S. T. Grisamore, editor Thibodeaux Sentinel, Thibodeaux, La.; Sugar Planters' Association, Donaldsonville, La.; Vicksburg Herald, Vicksburg, Miss.; Natchez Democrat, Natchez, Miss.; Dr. Trezevant, Delta, La.; B. Myrick, Girard, La.; Hon. R. C. McCullough, Waterproof, La.; New Orleans Picayune, New Orleans, La.; New Orleans Times-Democrat, New Orleans, La.; The States, New Orleans, La.; New Orleans Daily City Item, New Orleans, La.; New Orleans Bee, New Orleans, La.; The German Gazette, New Orleans, La.; Cotton Exchange, New Orleans, La.; Produce Exchange, New Orleans, La.; Sugar Exchange, New Orleans, La.; Maritime Association, New Orleans, La.; Major Richardson, Chief of State Board of Engineers, New Orleans, La.; W. M. Davidson, Saint Joseph, La.; V. M. Purdy, Lake Providence, La.; Dr. S. S. P. Dangerfield, Delta, La.

The pay of the special river observers is at the rate of 25 cents per observation made, recorded, enciphered, and delivered at the telegraph office. When three or more observations are made in any one day, the pay is at the rate of 75 cents per day.

The following are special rates of pay authorized by this office:

The observer at Eugene City, Oreg., receives 50 cents per observation, or $1.50 per day when more than three observations are taken in one day. The observer at Harper's Ferry, W. Va., receives 50 cents per observation. The observers at Helena, Ark., and Kansas City, Mo., receive 50 cents per day each. The observer at Muscatine, Iowa, renders his services gratuitously.

The following stations have been discontinued during the year:

Jefferson City, Mo. (Saint Louis Center), March 15, 1885; Lexington, Mo. (Saint Louis Center), March 15, 1885.

The following stations have been established during the year:

Stations.	When established.	Stations.	When established.
Brookville, Pa. (Pittsburg Center)	Nov. 19, 1884	Coushatta Chute, La. (Shreveport Center)	Jan. 15, 1885
Clarion, Pa. (Pittsburg Center)	Nov. 19, 1884	Girard, La. (New Orleans Center)	Jan. 30, 1885
Johnstown, Pa. (Pittsburg Center)	Nov. 19, 1884	Delhi, La. (New Orleans Center)	Jan. 30, 1885
Morgantown, W. Va. (Pittsburg Center)	Nov. 19, 1884	Beardstown, Ill. (Saint Louis Center)	Mar. 7, 1885
Parker's Landing, Pa. (Pittsburg Center)	Nov. 19, 1884	Jerome, Mo. (Saint Louis Center)	Mar. 7, 1885
Rowlesburg, W. Va. (Pittsburg Center)	Nov. 19, 1884	Prescott, Wis. (La Crosse Center)	Mar. 7, 1885
Warren, Pa. (Pittsburg Center)	Nov. 19, 1884	Wabasha, Minn. (La Crosse Center)	Mar. 7, 1885
Weston, W. Va. (Pittsburg Center)	Nov. 19, 1884	Louisiana, Mo. (Saint Louis Center)	Mar. 7, 1885
Burnside, Ky. (Nashville Center)	Dec. 1, 1884	Arkansas City, Ark. (Vicksburg Center)	May 11, 1885
Carthage, Tenn. (Nashville Center)	Dec. 1, 1884	Bayou Sara, La. (New Orleans Center)	May 11, 1885
Alexandria, La. (New Orleans Center)	Jan. 10, 1885	Newport, Ark. (Vicksburg Center)	May 11, 1885
Fulton, Ark. (Shreveport Center)	Jan. 10, 1885	Yazoo City, Miss. (Vicksburg Center)	May 11, 1885
Grand Tower, Ill. (Cairo Center)	Jan. 15, 1885		

The special river station at Monroe, La., was transferred from the Washington City Center to the New Orleans Center January 30, 1885.

On June 12, 1885, special river stations were ordered to be established at Camden, Ark., and West Melville, La., under New Orleans Center, to date July 1, 1885.

On June 17, 1885, a special river station was ordered to be established at Mount Holly, N. C., under Charleston, S. C., Center, to take effect July 1, 1885.

By special request of the merchants and river captains along the Cumberland River, the special river observations at Burnside, Ky., under Nashville Center, were continued until June 30, 1885.

The following list gives the special river stations now in operation; also the period during which observations are taken, the center to which reports are made, etc.:

Albany, Oreg. (November 15 to December 15, and February 15 to May 1).—Takes observations daily, and, when the river approaches the danger line, telegraphs reports to Portland, Oreg., consolidated with those of Eugene City, when the latter has been received.

Alexandria, La. (all the year).—Takes observations daily, at 2 p. m., and telegraphs them to Observer, New Orleans, who is also authorized to call for special telegraphic reports. Telegraphs in case of a dangerous rise.

Beardstown, Ill. (all the year).—Takes observations daily, and, when dangerous rise occurs, or when special telegraphic reports are called for, telegraphs them to Saint Louis.

Boonville, Mo. (all the year).—Takes observations daily, and, in case of dangerous rise, or when special reports are called for, telegraphs to Saint Louis. Also telegraphs to Saint Louis in case of ice-dams, lumber obstructions, and closing of navigation.

Brookville, Pa. (all the year).—Takes observations daily, at 7 a. m. and 2 p. m., and telegraphs them to Pittsburg in case of dangerous rise; or when special reports are called for, telegraphs them to Pittsburg.

Brownsville, Pa. (all the year).—Takes observations daily, at 7 a. m. and 2 p. m. and telegraphs them to Pittsburg in case of dangerous rise; or when called for, telegraphs special reports to Pittsburg.

Brunswick, Mo. (all the year).—Takes observations daily at 2 p. m. Telegraphs to Saint Louis in case of a dangerous rise and also telegraphs to Saint Louis when special reports are called for by the observer, and in case of ice dams or other obstructions in the river, and the opening and closing of navigation.

Burnside, Ky. (December to April, both inclusive).—Takes observations daily at 2 p. m. and transmits them by postal-card to Nashville. When river rises 6 feet or more during twenty-four hours, or rainfall equals or exceeds 2 inches the 2 p. m. observation is telegraphed to Nashville; also in case of dangerous rise or when called for by observer, Nashville, telegraphs him special reports at 8 a. m. and 8 p. m. Special reports are also made to Nashville of the formation or breaking up of ice in the river and of the opening and closing of navigation.

Carthage, Tenn. (December to April, both inclusive).—Takes observations daily at 2 p. m. and transmits by postal-card to Nashville. When river rises 5 feet or more during past twenty-four hours, or rainfall equals or exceeds 2 inches the 2 p. m. observation is telegraphed to Nashville; also in case of dangerous rise or when called for by observer, Nashville, special reports are made and telegraphed at 8 a. m and 8 p. m. Special telegraphic reports are made on breaking up of ice, formation of obstructions, and opening and closing of navigation.

Charleston, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m. and transmits by postal-card to Chattanooga. In case of dangerous rise, or when special reports are called for, they are made at 8 a. m. and 8 p. m. and telegraphed to Chattanooga.

Clarion, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, special reports are made to Pittsburg by telegraph.

Clinton, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal card to Chattanooga. In case of dangerous rise, or when called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Colusa, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs special observations to Sacramento (consolidated with report from Red Bluff, if received).

Confluence, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

Coushatta Chute, La. (all the year).—Takes observations daily at 2 p. m. and transmits by telegraph to Shreveport. In case of dangerous rise, or when called for, telegraphs special reports to Shreveport.

Decatur, Ala. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Delhi, La. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when called for, special reports are telegraphed to New Orleans.

Eugene City, Oreg. (November 15 to December 15 and February 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Portland, Oreg.

Evansville, Ind. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Freeport, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

Folsom City, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs special reports to Sacramento.

Fulton, Ark. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Shreveport.

Grand Tower, Ill. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to Cairo.

Girard, La. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to New Orleans.

Harper's Ferry, W. Va. (——).—Takes observations in case of a sudden rise, &c., and telegraphs them to "Signals, Washington."

Helena, Ark. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, special observations are telegraphed to Vicksburg and "Signals, Washington."

Hermann, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs reports to Saint Louis and "Signals, Washington."

Jerome, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs reports to Saint Louis.

Johnstown, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and telegraphs to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

Johnsonville, Tenn. (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to "Signals, Washington."

Kansas City, Mo. (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

Kingston, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Leadvale, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Le Claire, Iowa (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to "Signals, Washington."

Louisiana, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis.

Loudon, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Mahoning, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Marietta, Ohio (all the year).—Takes observations daily at 2 p. m. In case of a dangerous rise, or when called for, telegraphs to "Signals, Washington."

Marysville, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of a dangerous rise, special reports, consolidated with special reports from Oroville, are telegraphed to Sacramento.

Monroe, La. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to New Orleans.

Morgantown, W. Va., (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Mount Carmel, Ill. (all the year).—Takes observations daily at 2 p. m.; in case of dangerous rise, telegraphs to postmaster Shawneetown, Ill.

Muscatine, Iowa (all the year).—Takes observations daily at 2 p. m.

New Geneva, Pa. (all the year).—Takes observations at 7 a. m. and 2 p. m. daily, and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Oil City, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and telegraphs to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Oroville, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, special observations are telegraphed to observer, Marysville, Cal.

Parker's Landing, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Paducah, Ky. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Peoria, Ill. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

Plattsmouth, Nebr. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Prescott, Wis. (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to La Crosse.

Rockwood, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Rowlesburg, W. Va. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Saint Joseph, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, special reports are telegraphed to "Signals, Washington."

Saltsburg, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Strawberry Plains, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when special reports are called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Umatilla, Oreg. (November 15 to December 15 and February 15 to July 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Portland, Oreg.

Wabasha, Minn. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to La Crosse.

Warsaw, Ill. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

Warren, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Weston, W. Va. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Wheeling, W. Va. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when called for, special reports are telegraphed to "Signals, Washington."

The following is a list of stations that have not yet gone into operation: Arkansas City, Ark. (Vicksburg center); Bayou Sara, La. (New Orleans center); Newport, Ark. Vicksburg center); Yazoo City, Miss. (Vicksburg center); Camden, Ark. (New Orleans center); West Melville, La. (New Orleans center); Mount Holly, N. C. (Charleston center).

Orders have been issued for the establishment of the stations in the above list, and as soon as river-gauges are erected and observers appointed the observations will commence.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY.

APPENDIX 58.

REPORT ON THE COTTON-REGION SYSTEM.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have now the honor to submit my report of the work done in stations division in connection with the system of cotton-region reports, for the year ending June 30, 1885.

This system was inaugurated in September, 1881, upon the earnest request of citizens interested in the cultivation of cotton. By the co-operation of the railway and telegraph officials where stations are located, it has been thoroughly organized and the reports are considered of inestimable value to the planters in the cotton region, and to cotton interests throughout the country.

The reports of rainfall and maximum and minimum temperatures are promptly distributed from the district centers, and all the leading cities of the South are supplied daily with the information they furnish; they are also published in the newspapers and bulletined at cotton exchanges and other prominent places, where they are readily accessible to business men and the general public.

The work when begun in 1881 was necessarily rather limited in extent, but it has since been greatly extended and systematized, so that it is now one of the most valuable features of the Signal Service. It is gratifying to state that the efforts made in this direction are fully appreciated by those in whose interest the system was established.

The reports are collected and disseminated throughout the commercial centers of the cotton region from April 1 to October 31 of each year; this year, however, owing to the small balance of the appropriation available for the purpose, the observations at the various stations were not commenced until May 1. Many protests were made by the cotton exchanges and the classes mostly interested in cotton, but it was found necessary either to take this action or close a large number of stations. It was thought best for all interests that the full number of stations be maintained, in consequence of which observations could not be commenced until May 1.

Observations of maximum and minimum temperatures and rainfall are taken simultaneously at all stations in the cotton region at 6 p. m., seventy-fifth meridian time. The manner of taking observations, telegraphing reports, and collecting and distributing the information at the centers has been continued as described in detail in my report for the year ending June 30, 1884.

The following is a description of the forms used in connection with this work:

Form 138 is a manifold bulletin showing the average maximum and minimum temperatures and rainfall for the several districts, for the past twenty-four hours, and is posted daily at each center, in prominent places most convenient to persons interested.

Form 138*b* is also a manifold bulletin and is used by the centers to show the maximum and minimum temperatures and rainfall at each station in their respective districts.

Form 144 is used by each cotton-region station to record the maximum and minimum temperatures, rainfall, time of taking observation and time of filing the report for transmission. The form is mailed to the district center at the end of each month, where it is critically examined and afterward forwarded to this office for use in the preparation of meteorological data.

Form 203 (card) is used by the observers at substations in enciphering the observations and, after the report has been transmitted by telegraph, it is retained and filed as part of the station records.

Form 150 (card) "Condition of Instruments," is used once each month by each station to report the condition of the meteorological instruments to the district center.

Form 144*b* is used to report the total amount of rainfall daily and weekly, at regular stations of the Signal Service in the cotton region. It is prepared at this office from the regular 7 a. m., 3 p. m., and 11 p. m. reports, and is mailed to observers and others on Saturday of each week. The information is furnished in the interest of cotton exchanges, merchants, and cotton planters. The form is sent to the Signal Service observers at Atlanta, Augusta, Baltimore, Charleston, Cincinnati, Galveston, Indianola, Jacksonville, Knoxville, Little Rock, Louisville, Lynchburg, Memphis, Mobile, Montgomery, Nashville, New Orleans, New York, Norfolk, Pensacola, Savannah, Shreveport, Vicksburg, and Wilmington; also to the Board of Trade, Savannah, Ga., Commercial Bulletin, Boston, Mass., Mr. J. F. Wheless, Cotton Exchange, Nashville, Tenn., Mr. C. W. Simmons, secretary and treasurer, Cotton Exchange, Saint Louis, Mo., and the Secretary National Board of Health, Washington, D. C.

Each cotton-region station is supplied with the following: One instrument shelter; one maximum thermometer; one minimum thermometer; one rain-gauge and measuring stick; supply of official cards (forms 150 and 203) and forms 144.

Observations were continued during July, August, September, and October, 1884. They were discontinued October 31, 1884, and resumed May 1, 1885.

The various cotton-region stations are arranged in sections as follows:

Each section is under the observer in charge of a regular station of the Signal Service, which station is known as the "section center." When practicable the name of the section center is used to designate the section.

Cotton-region stations receive all instructions from or through and render all reports and bills to the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special stations and then forward them to this office.

If reports or bills are not received at the section centers within three days after the date on which they are due, they are called for by mail. Any persistent neglect of the special stations in this direction is reported to the Chief Signal Officer with such recommendation as the observer may consider proper to make to improve the service. Defective reports which cannot be remedied at section centers are returned for correction. Section centers make a report to the Chief Signal Officer on the fifteenth day of each month of the reports which are missing for the previous month, giving the probable reason therefor.

In certifying to bills, great care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover are received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center: "The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62*a*), and filled out as follows:

"For services as ———, at ———, for the month of ———, 188—, for ——— (give the number of reports), at ——— cents per report."

When an observation or report has been missed, the fact is noted on the face of the bill, for example, "No observations taken August 2 and 7." The bill is altered to agree with the work done.

Observers in charge of section centers are held responsible for the correctness of all bills certified to by them, and they are required to assure themselves of their accuracy before forwarding to this office.

The pay of the civilian observers continues at 20 cents per report made. The operators employed at centers, &c., collecting reports for concentration receive 5 cents per report.

Messengers are employed collecting reports from railroad offices at centers, &c., at the following places:

Houston, Tex., $5 per month; New Orleans, La., $15 per month; Selma, Ala., $5 per month. Mr. J. H. McHugh, operator at New Orleans, is paid $6 per month, by special authority, for receiving reports from Amite City, La., Brookhaven, Miss., and Hazlehurst, Miss. An operator is employed, by special authority, at Houston, Tex., to transfer reports to Galveston center, from six substations, at 5 cents per report.

The cotton-region station at Hempstead, Tex., under Galveston center, was discontinued March 14, 1885. The station at Whiteville, La., under New Orleans center, was discontinued June 10, 1885.

A cotton-region station was established at Port Gibson, Miss., under New Orleans center, June 10, 1885.

The committee on information and statistics, New Orleans Cotton Exchange, being desirous of obtaining complete data from all substations, requested that the observers be directed to send their retained Forms 144 to the New Orleans center for making out a monthly report. As it was not considered advisable to send the Forms 144, the observer in charge of each cotton-region center was instructed, March 20, 1885, to mail daily a copy of Form 138 to the New Orleans center.

Our observer at Shreveport, La., in letter of February 19, 1885, states that great interest is manifested in the Signal Service reports, and suggests that Shreveport be made a cotton-region center. He was told that the appropriation was not sufficient to admit of establishing new stations and making Shreveport a center. The observers at Galveston, Little Rock, and New Orleans were directed, on March 6, 1885, to mail daily to observer, Shreveport, a copy of Form 138*b*, containing reports from the stations in their districts.

Cotton-region stations have been requested at other points, but the limited appropriation would not admit of their being established.

The railroad companies generally and the various cotton exchanges throughout the cotton region have, as heretofore, extended many courtesies to our observers, and have aided in promoting the usefulness of this system of reports.

The list of railroads co-operating with the Signal Service in the distribution of the reports, given in my report for the year ending June 30, 1884, remains unchanged.

There are at present 155 stations taking observations and rendering reports, viz., nineteen regular Signal Service stations and 136 special cotton-region stations, as will be seen by the following list:

District centers.	Substations.
Atlanta, Ga.*	Anderson, S. C.; Cartersville, Ga.; Columbus, Ga.; Dalton, Ga.; Gainesville, Ga.; Greenville, S. C.; Griffin, Ga.; Macon, Ga.; Newnan, Ga.; Spartanburg, S. C.; Toccoa, Ga.; West Point, Ga.
Augusta, Ga*	Allendale, S. C.; Athens, Ga.; Batesburg, S. C.; Blackville, S. C.; Camak, Ga.; Chester, S. C.; Columbia, S. C.; Greenwood, S. C.; Union Point, Ga.; Washington, Ga.; Waynesborough, Ga.
Charleston, S. C.*	Branchville, S. C.; Hardeeville, S. C.; Jacksonborough, S. C.; Kingstree, S. C.; Saint George's, S. C.; Saint Matthew's, S. C.; Yemassee, S. C.
Galveston, Tex.*	Austin, Tex.; Beaumont, Tex.; Belton, Tex.; Columbia, Tex.; Corsicana, Tex.; Cuero, Tex.; Dallas, Tex.; Hearne, Tex.; Houston, Tex.; Huntsville, Tex.; Longview, Tex.; Luling, Tex.; Orange, Tex.; *Palestine Tex.; *San Antonio, Tex.; Sour Lake, Tex.; Tyler, Tex.; Waco, Tex.; Weatherford, Tex.; Weimar, Tex.
Little Rock, Ark.*	Arkansas City, Ark.; Brinkley, Ark.; Devall's Bluff, Ark.; *Fort Smith, Ark.; Helena, Ark.; Kensett, Ark.; Madison, Ark.; Magnolia, Ark.; Malvern, Ark.; Monticello, Ark.; Newport, Ark.; Paris, Tex.; Pine Bluff, Ark.; Prescott, Ark.; Russellville, Ark.; Texarkana, Ark.
Memphis, Tenn.*	Batesville, Miss.; Bolivar, Tenn.; Brownsville, Tenn.; Corinth, Miss.; Covington, Tenn.; Decatur, Ala.; Dyersburg, Tenn.; Grand Junction, Tenn.; Grenada, Miss.; Hernando, Miss.; Holly Springs, Miss.; Milan, Tenn.; *Nashville, Tenn; Oxford, Miss.; Paris, Tenn.; Scottsborough, Ala.; Tuscumbia, Ala.; Withe, Tenn.
Mobile, Ala.*	Aberdeen, Miss.; Columbus, Miss.; Evergreen, Ala.; Livingston, Ala.; Macon, Miss.; Meridian, Miss.; Okolona, Miss.; Waynesborough, Miss.
Montgomery, Ala.*	Birmingham, Ala.; Calera, Ala.; Eufaula, Ala.; Fort Deposit, Ala.; Greenville, Ala.; Marion, Ala.; Pine Apple, Ala.; Opelika, Ala.; Selma, Ala.
New Orleans, La.*	Alexandria, La.; Amite City, La.; Brookhaven, Miss.; Cheneyville, La.; Coushatta Chute, La.; Hazlehurst, Miss; Lafayette, La.; Minden, La.; Natchez, Miss.; Natchitoches, La.; Opelousas, La.; Port Gibson, Miss.; *Shreveport, La.
Savannah, Ga.*	Albany, Ga.; Allapaha, Ga.; Bainbridge, Ga.; *Cedar Keys, Fla.; Eastman, Ga.; Fernandina, Fla.; Fort Gaines, Ga.; Jessup, Ga.; Live Oak, Fla.; Millen, Ga.; Quitman, Ga.; Smithville, Ga.; Thomasville, Ga.; Waldo, Fla.; Way Cross, Ga.
Vicksburg, Miss.*	Edwards, Miss.; Jackson, Miss.; Lake, Miss.; Monroe, La.
Wilmington, N. C.*	*Charlotte, N. C.; Cheraw, S. C.; Florence, S. C.; Goldsborough, N. C.; Lumberton, N. C.; New Berne, N. C.; Raleigh, N. C.; Salisbury, N. C.; Wadesborough, N. C.; Weldon, N. C.

NOTE.—Stations marked thus * are regular Signal Service stations.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 59.

Classified list of stations of the Signal Service, United States Army, in operation on June 30, 1885, *compiled in the stations division, for the annual report of the Chief Signal Officer for the year ending June* 30, 1885.

[(1) Takes one observation per day, at sunset; (2) takes two observations per day; (3) takes three observations per day—all telegraphed; (3*a*) takes three observations per day—none telegraphed; (5) takes five observations per day—three telegraphed; (5*a*) takes five observations per day—one telegraphed; (5*b*) takes five observations per day—none telegraphed; (6) takes six observations per day—three telegraphed.]

Alabama.—Stations of the second order: Mobile (5), Montgomery (5). Special display station: Fort Morgan. Special river station: Decatur. Special cotton-region stations: Birmingham, Calera, Decatur, Eufaula, Evergreen, Greenville, Fort Deposit, Livingston, Marion, Pine Apple, Opelika, Scottsborough, Selma, Tuscumbia.

Alaska.—Stations of the second order: Fort Alexander (3*a*), Mumtrekhlagamut (3*a*), Fort Saint Michael's (3*a*), Sitka (3*a*), Unalashka (3*a*). Stations of the third order: Anvik (2), Atka (2), Cordova Bay (2), Hoochnahoo (2), Hoonyah (2), Kenai (2), Koskokvim (2), Port Etches (2), Pyramid Harbor (2), Tananah (2), Tcha-tow-klin (2), Fort Wrangell (2), Yakutat Bay (2), Golovin Bay (1), Harrisburg (or Juneau City) (1), Mission (1), Nuduckayet (1), Nulato (1), Fort Reliance (1), Saint George Island (1), Ugashik (1).

Arizona.—Stations of the second order: Fort Apache (3), Fort Grant, (3*a*), Prescott (6), Camp Thomas (3*a*), Yuma (5). Stations of the third order: Apache Pass (1), Maricopa (1), Fort McDowell (1), Phœnix (1), San Carlos Agency (1), Fort Verde (1), Wickenburg (1), Willcox (1). Repair station: Ash Fork.

Arkansas.—Stations of the second order: Fort Smith (5), Little Rock (5). Special River stations: Arkansas City, Camden, Fulton, Helena, Newport. Special cotton-region stations: Arkansas City, Brinkley, Devall's Bluff, Helena, Kensett, Madison, Magnolia, Malvern, Monticello, Newport, Pine Bluff, Prescott, Russellville, Texarkana.

Behring Sea.—Station of the second order: Behring's Island (3*a*).

California.—Stations of the second order: Fort Bidwell (3*a*), Cape Mendocino (5), Keeler (5*b*), Los Angeles (5), Red Bluff (5), Sacramento (5), San Diego (5), San Francisco (6), San Luis Obispo (5). Special River stations: Colusa, Folsom City, Maryville, Oroville.

Colorado.—Stations of the second order: Denver (5), Pike's Peak (5*b*), Montrose (3), West Las Animas (5). Station of the third order: Durango (1).

Connecticut.—Stations of the second order: New Haven (5), New London (5*b*). Special display stations: New Haven Light, Stonington.

Dakota.—Stations of the second order: Fort Bennett (3), Bismarck (5), Fort Buford (3), Deadwood (3), Huron (5), Fort Totten (3), Yankton (5). Stations of the third order: Fort Meade (1), Fort Sully (1), Webster (1), Fort Yates (1). Repair station: Larimore.

Delaware.—Station of the third order: Cape Henlopen.

District of Columbia.—Station of the first order: Washington (6).

Florida.—Stations of the second order: Cedar Keys (5). Jacksonville (5), Key West (5), Pensacola (5), Sanford (5). Special display stations: Fernandina, Fort George Island, Saint Augustine, Sand Key Light. Special cotton-region stations: Live Oak, Waldo, Fernandina.

Georgia.—Stations of the second order; Atlanta (5), Augusta (5), Savannah (5). Special display stations: Brunswick, Tybee Island. Special cotton-region stations: Albany, Allapaha, Athens, Bainbridge, Camak, Cartersville, Columbus, Dalton, Eastman, Fort Gaines, Gainesville, Griffin, Jessup, Macon, Millen, Newnan, Quitman, Smithville, Thomasville, Toccoa, Union Point, Washington, Way Cross, Waynesborough, West Point.

Idaho.—Stations of the second order: Boise City (5*b*), Lewiston (3). Stations of the third order: Fort Cœur d'Alene (1).

Illinois.—Stations of the second order: Cairo (5), Chicago (6), Springfield (5). Special river stations: Beardstown, Grand Tower, Peoria, Mount Carmel, Warsaw.

Indiana.—Stations of the second order: Greencastle (5), Indianapolis (5). Special river stations: Evansville. Special printing station: Logansport.

Indian Territory.—Station of the second order: Fort Sill (3). Stations of the third order: Fort Reno (1), Fort Supply (1). Repair station: Cantonment.

Iowa.—Stations of the second order: Davenport (5), Des Moines (5), Dubuque (5*a*), Keokuk (5). Special river stations: Le Claire, Muscatine. Special printing station: Burlington.

Kamtchatka.—Station of the third order: Petropaulovski (2).

Kansas.—Stations of the second order: Dodge City (5), Leavenworth (5), Concordia (5).

Kentucky.—Station of the second order: Louisville (5). Special river stations: Burnside, Paducah.

Louisiana.—Stations of the second order: New Orleans (5), Shreveport (5). Special display station: Port Eads. Special river stations: Alexandria, Bayou Sara, Coushatta Chute, Delhi, Girard, Monroe, West Melville. Special cotton-region stations: Alexandria, Amite City, Cheneyville, Coushatta Chute, Lafayette, Minden, Monroe, Natchitoches, Opelousas.

Maine.—Stations of the second order: Eastport (5), Portland (5). Special display stations: Bath, Boothbay, Rockland, Southwest Harbor. Special printing station: Bangor.

Maryland.—Station of the second order: Baltimore (5). Station of the third order: Ocean City (1).

Massachusetts.—Station of the second order: Boston (6). Special display stations: Bass River Light, Fall River, Gloucester, Highland Light, Hyannis, Marblehead, New Bedford, Newburyport, Provincetown, Wood's Holl.

Michigan.—Stations of the second order: Alpena (5), Detroit (5), Escanaba (5), Grand Haven (5), Mackinaw City (5), Marquette (5), Port Huron (5). Special display stations: Bay City, Charlevoix, Cheboygan, East Tawas, Elk Rapids, Frankfort, Ludington, Manistee, Menominee, Montague, Muskegon, Northport, Pentwater, Petoskey, Saint Joseph, Sand Beach, South Haven, Traverse City.

Minnesota.—Stations of the second order: Duluth (3), Moorhead (5), Saint Paul (5), Saint Vincent (5). Special river station: Wabasha.

Mississippi.—Station of the second order: Vicksburg (5). Special cotton-region stations: Aberdeen, Batesville, Brookhaven, Columbus, Corinth, Edwards, Grenada, Hazlehurst, Hernando, Holly Springs, Jackson, Lake, Macon, Meridian, Natchez, Okolona, Oxford, Port Gibson, Waynesborough. Special river station: Yazoo City.

Missouri.—Stations of the second order: Saint Louis (6), Lamar (5). Special river stations: Boonville, Brunswick, Hermann, Jerome, Kansas City, Louisiana, Saint Joseph.

Montana.—Stations of the second order: Fort Assinaboine (3), Fort Benton (3), Fort Custer (3), Helena (3), Fort Maginnis (3), Poplar River (3), Fort Shaw (3). 'Repair stations: Galpin, Glendive, Terry's Landing.

Nebraska.—Stations of the second order: North Platte (5), Omaha (5), Valentine (5). Special river station: Plattsmouth. Repair station: Fort Robinson.

Nevada.—Station of the second order: Winnemucca (5).

New Hampshire.—Station of the second order: Mount Washington (5). Special display station: Portsmouth.

New Jersey.—Stations of the second order: Atlantic City (5), Barnegat City (5), Cape May (3*a*), Sandy Hook (5). Station of the third order: Little Egg Harbor (1).

New Mexico.—Stations of the second order: Fort Stanton (3), Santa Fé (5). Stations of the third order: Lava (1), Watrous (1).

New York.—Stations of the second order: Albany (5), Buffalo (5), New York City (6), Oswego (5), Rochester (5). Special display stations: Cape Vincent, Charlotte, City Island, Dunkirk, North Fair Haven.

North Carolina.—Stations of the second order: Charlotte (5), Hatteras (5), Kittyhawk (5), Fort Macon (5), Smithville (5), Wilmington (5). Stations of the third order: New River Inlet (1), Wash Woods (1). Special cotton-region stations: Goldsborough, Lumberton, New-Berne, Raleigh, Salisbury, Wadesborough, Weldon.

Ohio.—Stations of the second order: Cincinnati (6), Cleveland (5), Columbus (5), Sandusky (5), Toledo (5). Special river station: Marietta. Special display station: Ashtabula.

Oregon.—Stations of the second order: Portland (5), Roseburg (5). Stations of the third order: Ashland (1), Astoria (1), Fort Klamath (1), Lakeview (1), Linkville (1). Special river stations: Albany, Eugene City, Umatilla.

Pennsylvania.—Stations of the second order: Erie (5), Philadelphia (6), Pittsburg (6). Special river stations: Brookville, Brownsville, Clarion, Confluence, Freeport, Johnstown, Mahoning, New Geneva, Oil City, Parker's Landing, Saltsburg, Warren.

Rhode Island.—Station of the second order: Block Island (5). Stations of the third order: Narragansett Pier (1); Point Judith (1). Special display stations: Bristol, Newport, Southeast Light, Block Island.

South Carolina.—Station of the second order: Charleston (5). Special display station: Port Royal. Special cotton-region stations: Allendale, Anderson, Batesburg, Blackville, Branchville, Cheraw, Chester, Columbia, Florence, Greenville, Greenwood, Hardeeville, Jacksonborough, Kingstree, Saint George's, Saint Matthew's, Spartanburg, Yemassee.

Tennessee.—Stations of the second order: Chattanooga (5), Knoxville (5), Memphis (5), Nashville (5). Special river stations: Charleston, Clinton, Johnsonville, Carthage, Kingston, Leadvale, Rockwood, Loudon, Strawberry Plains. Special cotton-region stations: Bolivar, Brownsville, Covington, Dyersburg, Grand Junction, Milan, Paris, Withe.

Texas.—Stations of the second order: Brownsville (3), Fort Concho (5), Fort Davis (3*a*), Fort Elliott (3), El Paso (5), Galveston (5), Indianola (5), Palestine (5), Rio Grande City (5), San Antonio (3), Fort Stockton (3). Stations of the third order: Henrietta (1), Marfa (1). Special display station: Corpus Christi. Special cotton-region stations: Austin, Beaumont, Belton, Columbia, Corsicana, Cuero, Dallas, Hearne, Houston, Huntsville, Longview, Luling, Orange, Paris, San Antonio, Sour Lake, Tyler, Waco, Weatherford, Weimar.

Utah.—Stations of the second order: Salt Lake City (5), Frisco (5*b*).

Virginia.—Stations of the second order: Cape Henry (5), Chincoteague (5), Lynchburg (5), Fort Myer (5), Norfolk (5). Special display station: Fort Monroe.

Washington Territory.—Stations of the second order: Fort Canby (5), Dayton (3*a*), Olympia (5), Port Angeles (3), Spokane Falls (3), Tatoosh Island (3). Stations of the third order: Neah Bay (1), Pysht (1), Fort Spokane (1).

West Virginia.—Special river stations: Morgantown, Rowlesburg, Weston, Wheeling.

Wisconsin.—Stations of the second order: La Crosse (5), Milwaukee (5). Special display stations: Ahnapee, Green Bay, Kenosha, Kewaunee, Manitowoc, Racine, Sheboygan, Sturgeon Bay. Special river station: Prescott.

Wyoming.—Stations of the second order: Fort Bridger (5), Cheyenne (5). Station of the third order: Fort Laramie (1). Repair station: Carter.

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

APPENDIX 60.

REPORT ON THE DISPLAY OF CAUTIONARY SIGNALS AT SPECIAL STATIONS.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have the honor to make the following report upon the special cautionary-signal display stations of the Signal Service in operation during the year ending June 30, 1885:

The special display stations are located on the Great Lakes, the Atlantic coast, and the Gulf coast. They are grouped in sections, each section being under the supervision of the observer in charge of a regular Signal Service station as near the center of the section as possible, who receives orders to hoist and lower signals at stations in his section direct from this office.

Displaymen hoist the cautionary signal upon receipt of the order from the observer in charge of their section and acknowledge receipt to him immediately by telegraph. They also bulletin the order and accompanying message for the information of shipping interests. When signals are ordered down they acknowledge receipt by telegraph, giving the maximum velocity of wind and direction during the display. In the absence of instruments, the wind velocity is determined by the Signal Service scale.

The cautionary signal when displayed signifies:

1. That it is thought probable from a study of the weather reports received at the central office, that dangerous winds will prevail at or in the vicinity of the place at which the signal is displayed.
2. That the danger appears to be so great as to demand precaution on the part of mariners and others, and general preparation for rough weather.
3. It calls for frequent examination of local barometers, and other instruments, and the study of the local signs of the weather, as clouds, &c.

Each display station is supplied with two or more red flags, one 6 feet and the other 8 feet square, having square black centers one-third the size of the flag; two red signal-lanterns, one large flag-staff, and one wind-vane. Stations designated to display cautionary off-shore or northwest signals are, in addition, supplied with white flags with black centers and with white lanterns. The flag-staff is at least 25 feet in height, and so placed as to make the signal clearly visible from the harbor and shipping. The necessary stationery and supply of Forms 112 are also sent to each station.

Form 112, containing the data relative to the display of signals, is forwarded weekly to the observer in charge of the section from each display station in the section.

As soon as practicable after a cautionary signal has been lowered, the displayman collects from mariners and others, data concerning the violence of the storm, the nature and extent of disasters and other casualties, and the benefits derived from the display of the signals. These statements include everything within the displayman's personal knowledge. The information so collected is entered in the column of "Remarks," on Form 112, or, when that column is filled, it is made on a sheet of paper, which is afterwards attached to that form. It is also stated whether any storm passed over the station during the week for which cautionary signals were not ordered, and newspaper clippings having reference to storms are used to accompany the report.

Displaymen receive all instructions from or through, and render all reports and bills to, the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special display stations, and then forward them to this office.

If reports or bills are not received at the section centers within three days after the date on which they are due, they are called for by mail. Any persistent neglect of the displaymen in this direction is reported to the Chief Signal Officer, with such recommendation as the observer may consider proper to make to improve the service. When errors are detected in Forms 112 which cannot be remedied at the section centers, they are returned to the displayman for correction.

In certifying to bills great care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover have been received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center:

"The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62*a*), and filled out as follows:

"For services rendered as displayman, at ———, for the month of ———, 188—, for ——— (give the number of days), at ——— cents per day."

Observers in charge of centers are held responsible for the correctness of all bills certified to by them, and they are required to assure themselves of their accuracy before forwarding to this office.

As a rule the special display stations on the lakes display signals only during the season of navigation, which generally continues from about April 15 to December 15 of each year; those on the Atlantic and Gulf coasts display throughout the year. The lake stations at South Haven, Mich., Saint Joseph, Mich., and Ludington, Mich., also display signals during the entire year.

Displaymen are paid by this Service only during the season for which signals are displayed.

There are fifty-nine displaymen who receive pay at the rate of 25 cents per day; one at 35 cents per day; two at 50 cents per day, and one at $15 per month. The displaymen at Wood's Holl, Mass., receives $3 per month extra compensation for special services.

The display stations are thoroughly organized and equipped, and the displaymen fully instructed in their duties, which they perform conscientiously and intelligently. The large amount of valuable property saved and the assistance rendered mariners and others each year by means of this system of storm warnings, make it impossible to overestimate its importance to the shipping and commercial interests of the country.

The following have been established as special display stations during the year: Cheboygan, Mich., July, 23, 1884; repeats Mackinaw City signals. Port Eads, La., January 15, 1885, will repeat New Orleans signals. Arrangements for the display of signals have not yet been made at this point.

The following special display stations have been discontinued during the year: Fire Island, N. Y., December 1, 1884; Fort Mackinac, Mich., March 14, 1885; Saint Ignace. Mich., March 14, 1885.

The order of October 6, 1884, establishing Jump, La., as a special-display station, was revoked January 15, 1885.

The following is a list of stations inspected during the year. The inspectors state that they found the displaymen to be energetic and competent men, the signals considered to be of great value, and much interest manifested at all places where signals are displayed. The property was found generally in good condition.

Station inspected.	Date.	Name of inspector.
	1885.	
Ahnapee, Wis	May 28	Sergt. S. W. Rhode.
Ashtabula, Ohio	April 24	Sergt. Peter Wood.
Bath, Me	April 27	Sergt. G. Liebmann.
Bay City, Mich	April 29	Sergt. N. B. Conger.
Brunswick, Ga	March 18	Sergt. S. C. Emery.
Bass River Light, Mass	May 22	Sergt. O. B. Cole.
Bristol, R. I	June 15	Sergt. J. G. Lynch.
Boothbay, Me	May 4	Sergt. G. Leibmann.
Cape Vincent, N. Y	April 23	Sergt. J. G. Linsley.
Charlotte, N. Y	April 21	Sergt. E. W. McGann.
Corpus Christi, Tex	May 12	Sergt. I. A. Reed.
Charlevoix, Mich	June 6	Sergt. T. B. Jennings.
Cheboygan, Mich	June 9	Sergt. T. B. Jennings.
City Island, N. Y	April 24	Sergt. W. W. Eichelberger.
Dunkirk, N. Y	April 25	Sergt. Peter Wood.
Elk Rapids, Mich	June 6	Sergt. T. B. Jennings.
East Tawas, Mich	April 30	Sergt. N. B. Conger.
Fernandina, Fla	April 28	Sergt. J. W. Smith.
Fort Monroe, Va	April 23	Sergt. J. P. Sherry.
Frankfort, Mich	June 1	Sergt. T. B. Jennings.
Fall River, Mass	June 16	Sergt. J. G. Lynch.
Fort George Island, Fla	April 28	Sergt. J. W. Smith.
Fort Morgan, Ala	April 23	Sergt. A. Pritchard.
Gloucester, Mass	June 9	Sergt. O. B. Cole.
Green Bay, Wis	June 1	Sergt. S. W. Rhode.
Hyannis, Mass	May 20	Sergt. O. B. Cole.
Highland Light, Mass	May 24	Sergt. O. B. Cole.
Kenosha, Wis	May 20	Sergt. S. W. Rhode.
Kewaunee, Wis	May 26	Sergt. S. W. Rhode.
Ludington, Mich	May 31	Sergt. T. B. Jennings.
Manistee, Mich	May 31	Sergt. T. B. Jennings.
Manitowoc, Wis	May 23	Sergt. S. W. Rhode.
Montague, Mich	May 30	Sergt. T. B. Jennings.

Station inspected.	Date.	Name of inspector.
	1885.	
Muskegon, Mich	May 29	Sergt. T. B. Jennings.
Marblehead, Mass	June 9	Sergt. O. B. Cole.
Menominee, Mich	June 3	Sergt. S. W. Rhode.
New Bedford, Mass	May 18	Sergt. O. B. Cole.
North Fair Haven, N. Y	April 22	Sergt. J. G. Linsley
Newport, R. I	June 17	Sergt. J. G. Lynch.
Northport, Mich	June 4	Sergt. T. B. Jennings.
Newburyport, Mass	June 10	Sergt. O. B. Cole.
New Haven Light, Conn	May 4	Sergt. J. H. Sherman.
Pentwater, Mich	May 30	Sergt. T. B. Jennings.
Port Royal, S. C	March 18	Sergt. S. C. Emery.
Petoskey, Mich	June 8	Sergt. T. B. Jennings.
Portsmouth, N. H	June 10	Sergt. O. B Cole.
Provincetown, Mass	May 23	Sergt. O. B. Cole.
Racine, Wis	May 19	Sergt. S. W. Rhode.
Rockland, Me	April 29	Sergt. G. Liebmann.
Sand Beach, Mich	May 2	Sergt. N. B Conger.
Sand Key Light, Fla	April 27	Sergt. J. Harvey Smith.
Sheboygan, Wis	May 22	Sergt. S. W. Rhode.
Stonington, Conn	May 18	Sergt. J. G. Lynch.
Southeast Light, R. I	April 27	Sergt. J. T. Eiker.
South Haven, Mich	May 28	Sergt. T. B. Jennings.
Southwest Harbor, Me	May 1	Sergt. G. Liebmann.
Saint Augustine, Fla	April 28	Sergt. J. W. Smith.
Saint Joseph, Mich	May 26	Sergt. T. B. Jennings.
Sturgeon Bay, Wis	May 30	Sergt. S. W. Rhode.
Traverse City, Mich	June 5	Sergt. T. B. Jennings.
Tybee Island, Ga	March 18	Sergt. S. C. Emery.
Wood's Holl, Mass	May 20	Sergt. O. B. Cole.

The following is the list of special display stations now in operation, arranged in sections:

Mackinaw section (Chicago, Ill., center).—Charlevoix, Mich.; Cheboygan, Mich.; Elk Rapids, Mich.; Frankfort, Mich.; Northport, Mich.; Petoskey, Mich.; Traverse City, Mich.

Grand Haven section (Chicago, Ill., center).—Ludington, Mich.; Manistee, Mich.; Montague, Mich.; Muskegon, Mich.; Pentwater, Mich.; Saint Joseph, Mich.; South Haven, Mich.

Milwaukee section (Milwaukee, Wis., center).—Kenosha, Wis.; Manitowoc, Wis.; Sheboygan, Wis.; Racine, Wis.

Green Bay section (Milwaukee, Wis., center).—Ahnapee, Wis.; Green Bay, Wis.; Sturgeon Bay, Wis.; Kewaunee, Wis.; Menominee, Mich.

Saginaw Bay section (Detroit, Mich., center).—Bay City, Mich.; East Tawas, Mich.; Sand Beach, Mich.

Erie section (Erie, Pa., center).—Ashtabula, Ohio; Dunkirk, N. Y.

Oswego section (Oswego, N. Y., center).—Cape Vincent, N. Y.; North Fair Haven, N. Y.

Portland section (Portland, Me., center.)—Bath, Me.; Boothbay, Me.; Rockland, Me.; Southwest Harbor, Me.

Boston section (Boston, Mass., center).—Gloucester, Mass.; Marblehead, Mass.; Newburyport, Mass.; Portsmouth, N. H.

Wood's Holl section (Boston, Mass., center).—Bass River Light, Mass.; Highland Light, Mass.; Hyannis, Mass.; New Bedford, Mass.; Provincetown, Mass.; Wood's Holl, Mass.

Newport section (New London, Conn., center).—Bristol, R. I.; Fall River, Mass.; Newport, R. I.; Stonington, Conn.

Narragansett section (Narragansett Pier, R. I., center).—Southeast Light, R. I.

Savannah section (Savannah, Ga., center).—Brunswick, Ga.; Port Royal, S. C.; Tybee Island, Ga.

Jacksonville section (Jacksonville, Fla., center).—Fernandina, Fla.; Fort George Island, Fla.; Saint Augustine, Fla.

The following-named stations repeat cautionary signal orders issued to the stations set opposite their respective names:

Charlotte, N. Y	Rochester, N. Y.
City Island, N. Y	New York City.
Corpus Christi, Tex	Indianola, Tex.
Fort Morgan, Ala	Mobile, Ala.
New Haven Light, Conn	New Haven, Conn.
Port Eads, La	New Orleans, La.
Sand Key Light, Fla	Key West, Fla.

Milwaukee, Wis., notifies by telegraph the postmasters at Ashland, Wis., and Houghton, Mich., of orders to hoist cautionary signals at Duluth, Minn., and Marquette, Mich.

Pensacola, Fla., notifies Apalachicola, Fla., of all cautionary signal orders for Pensacola.

Fort Monroe, Va., receives orders to hoist signals from Washington, D. C.

I am, very respectfully, your obedient servant.

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 61.

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, *together with the dates on which those not in operation on June* 30, 1885, *were closed.*

Station.	Established.	Remarks.
Albany, N. Y	Dec. 22, 1873	
Alexander, Fort, Alaska	Aug. 1, 1881	
Alpena, Mich	Sept. 10, 1872	
Apache, Fort, Ariz	Oct. 9, 1877	
Assinaboine, Fort, Mont	Oct. 6, 1879	
Atlanta, Ga	Sept. 25, 1878	
Atlantic City, N. J	Dec. 10, 1873	
Augusta, Ga	Nov. 2, 1870	
Baltimore, Md	Jan. 1, 1871	
Barnegat City, N. J	Dec. 10, 1873	
Behring's Island, Behring Sea	May 22, 1882	
Bennett, Fort, Dak	Dec. 22, 1879	
Benton, Fort, Mont	Nov. 25, 1871	Closed July 31, 1876; re-established October 11, 1879.
Bidwell, Fort, Cal	Jan. 1, 1885	
Billings, Mont	Jan. 1, 1883	Closed June 24, 1883.
Bismarck, Dak	Sept. 15, 1874	
Block Island, R. I	Sept. 1, 1880	
Boerne, Tex	May 6, 1876	Closed July 28, 1880.
Boise City, Idaho	July 1, 1877	
Boston, Mass	Nov. 1, 1870	
Brackettville, Tex	Sept. 1, 1875	Closed December 16, 1881.
Breckenridge, Minn	Apr. 10, 1872	Closed November 30, 1880.
Bridger, Fort, Wyo	Jan. 1, 1885	
Brownsville, Tex	Aug. 25, 1875	
Buffalo, N. Y	Nov. 1, 1870	
Buford, Fort, Dak	Oct. 23, 1878	
Burkes, Ariz	Dec. 5, 1877	Closed December 4, 1880.
Burlington, Vt	May 24, 1871	Closed June 15, 1883.
Cairo, Ill	June 1, 1871	
Campo, Cal	Jan. —, 1874	Closed September 30, 1882.
Canby, Fort, Wash	Sept. 1, 1883	
Cape Hatteras, N. C	Aug. 18, 1874	Closed November 30, 1880.
Cape Henry, Va	Dec. 15, 1873	
Cape Lookout, N. C	May 14, 1876	Closed December 31, 1880.
Cape May, N. J	May 24, 1871	
Cape Mendocino, Cal	July 27, 1882	
Castroville, Tex	Sept. 29, 1875	Closed March 29, 1882.
Cedar Keys, Fla	Nov. 7, 1879	
Champaign, Ill	Oct. 13, 1880	Closed March 31, 1883.
Charleston, S. C	Jan. 5, 1871	
Charlotte, N. C	Oct. 6, 1878	
Chattanooga, Tenn	Jan. 8, 1879	
Cheyenne, Wyo	Nov. 1, 1870	
Chicago, Ill	Nov. 1, 1870	
Chimo, Fort, Ungava Bay, Labrador	Nov. 1, 1882	Closed August 25, 1884.
Chincoteague, Va	Mar. 16, 1880	
Cincinnati, Ohio	Nov. 1, 1870	
Cleveland, Ohio	Nov. 1, 1870	
Coleman City, Tex	July 1, 1877	Closed September 5, 1883.
Colorado Springs, Colo	Nov. 12, 1873	Closed July 31, 1876.
Columbus, Ohio	July 1, 1878	
Concho, Fort, Tex	Oct. 10, 1875	
Concordia, Kans	Jan. 27, 1885	
Corinne, Utah	Sept. 1, 1871	Closed March 14, 1874.
Corsicana, Tex	Sept. 15, 1874	Closed October 31, 1881.
Craig, Fort, N. Mex	May 21, 1877	Closed June 27, 1879.
Custer, Fort, Mont	Dec. 5, 1878	Closed December 31, 1882; re-established July 21, 1883.
Davenport, Iowa	May 24, 1871	
Davis, Fort, Texas	Dec. 24, 1877	
Dayton, Wash	July 1, 1879	
Deadwood, Dak	Dec. 18, 1877	Closed June 1, 1878; re-established November 1, 1878.
Decatur, Tex	Feb. 1, 1876	Closed September 10, 1882.

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, *together with the dates on which those not in operation on June* 30, 1885, *were closed*—Continued.

Station.	Established.	Remarks.
Delaware Breakwater, Delaware	Jan. 28, 1880	Closed March 1, 1885.
Denison, Tex	Dec. 16, 1874	Closed March 31, 1883.
Denver, Colo	Nov. 19, 1871	
Des Moines, Iowa	Aug. 1, 1878	
Detroit, Mich	Nov. 1, 1870	
Dodge City, Kans	Sept. 15, 1874	
Dubuque, Iowa	July 10, 1873	
Duluth, Minn	Nov. 1, 1870	
Eagle Pass, Tex	Jan. 19, 1875	Closed June 15, 1883.
Eagle Rock, Idaho	Dec. 8, 1880	Closed June 15, 1883.
Eastport, Me	Apr. 1, 1873	
Elliott, Fort, Tex	Nov. 29, 1879	
El Paso, Tex	Nov. 5, 1877	
Erie, Pa	May 25, 1873	
Escanaba, Mich	May 24, 1871	
Evanston, Ill	Aug. 31, 1875	Closed July 31, 1876.
Florence, Ariz	Nov. 12, 1874	Closed April 30, 1882.
Fort Smith, Ark	June 1, 1882	
Fredericksburg, Tex	Mar. 14, 1876	Closed February 25, 1883.
Frisco, Utah	Jan. 27, 1885	
Galveston, Tex	Apr. 19, 1871	
Gibson, Fort, Ind. T	Apr. 1, 1873	Closed May 13, 1882.
Grand Haven, Mich	May 24, 1871	
Grant, Fort, Ariz	Nov. 1, 1875	
Greencastle, Ind	July 23, 1884	
Griffin, Fort, Tex	July 1, 1875	Closed April 14, 1882.
Hatteras, N. C	Dec. 1, 1880	
Helena, Mont	Oct. 15, 1879	
Henrietta, Tex	Feb. 1, 1877	Closed May 25, 1878; re-established February 9, 1879; closed March 31, 1883.
Hidalgo (Edinburg), Tex	Feb. 1, 1879	Closed January 27, 1882.
Huron, Dak	July 1, 1881	
Indianapolis, Ind	Feb. 10, 1871	
Indianola, Tex	May 1, 1772	
Jacksborough, Tex	May 8, 1875	Closed June 15, 1883.
Jacksonville, Fla	Sept. 11, 1871	
Keeler, Cal	Feb. 1, 1885	
Keogh, Fort, Mont	Nov. 18, 1878	Closed June 15, 1883.
Keokuk, Iowa	July 16, 1871	
Key West, Fla	Nov. 1, 1870	
Kitty Hawk, N. C	Jan. 15, 1875	
Knoxville, Tenn	Jan. 1, 1871	
La Crosse, Wis	Oct. 15, 1872	
Lady Franklin Bay, Grinnell Land	Aug. 5, 1881	Closed August 9, 1883.
Lake City, Fla	Nov. 1, 1870	Closed October 31, 1874.
Lamar, Mo	Oct. 17, 1884	
La Mesilla, N. Mex	June 16, 1876	Closed August 6, 1882.
Laredo, Tex	Dec. 16, 1875	Closed December 16, 1881.
Lead City, Dak	June 1, 1878	Closed October 31, 1878.
Leavenworth, Kans	May 21, 1871	
Lewiston, Idaho	July 1, 1879	
Lexington, Ky	Oct. 1, 1872	Closed July 24, 1876.
Little Rock, Ark	July 1, 1879	
Long Branch, N. J	Dec. 10, 1873	Closed July 8, 1876.
Los Angeles, Cal	July 1, 1877	
Louisville, Ky	Sept. 11, 1871	
Lynchburg, Va	May 21, 1871	
Mackinaw City, Mich	Aug. 20, 1882	
Macon, Fort, N. C	May 23, 1878	
Madison, Wis	Sept. 29, 1878	Closed March 31, 1883.
Maginnis, Fort, Mont	July 14, 1882	
Malone, N. Y	Aug. 1, 1875	Closed April 30, 1877.
Manhattan, Kans	Dec. 21, 1875	Closed July 31, 1876.
Marquette, Mich	May 1, 1871	Office burned February 1, 1885; re-established March 1, 1885.
Mason, Tex	Feb. 7, 1876	Closed April 14, 1882.
McKavett, Fort, Tex	Oct. 19, 1875	Closed February 19, 1883.
Memphis, Tenn	Feb. 28, 1871	
Milwaukee, Wis	Nov. 1, 1870	
Missoula, Fort, Mont	Dec 15, 1879	Closed June 15, 1883.
Mobile, Ala	Nov. 7, 1870	Office burned November 17, 1880; re-established November 22, 1880.
Montgomery, Ala	Nov. 9, 1870	
Montrose, Colo	Feb. 5, 1885	
Moorhead, Minn	Jan. 1, 1881	
Morgantown, W. Va	Jan. 25, 1873	Closed March 31, 1883.
Mount Washington, N. H	Dec. 1, 1870	
Mumtrekhlagamut, Alaska	Mar. 24, 1885	
Nashville, Tenn	Nov. 1, 1870	

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, *together with the dates on which those not in operation on June* 30, 1885, *were closed*—Continued.

Station.	Established.	Remarks.
New Haven, Conn	Dec. 10, 1872	
New London, Conn	Jan. 10, 1871	
New Orleans, La	Nov. 1, 1870	
Newport, R. I	Aug. 1, 1875	Closed March 31, 1883.
New York City	Nov. 1, 1870	
Norfolk, Va	Jan. 1, 1871	
North Platte, Nebr	Sept. 15, 1874	
Olympia, Wash	July 1, 1877	
Omaha, Nebr	Nov. 1, 1870	
Ooglaamie, Point Barrow, Alaska	Oct. 17, 1881	Closed August 7, 1883.
Oswego, N. Y	Nov. 1, 1870	
Palestine, Tex	Dec. 3, 1881	
Peck's Beach, N. J	Dec. 10, 1873	Closed February 23, 1876.
Pembina, Dak	Nov. 1, 1872	Closed September 3, 1880.
Pensacola, Fla	Oct. 27, 1879	
Philadelphia, Pa	Jan. 1, 1871	
Phœnix, Ariz	Aug. 18, 1876	Closed December 31, 1881.
Pike's Peak, Colo	Nov. 1, 1873	
Pilot Point, Tex	June 18, 1875	Closed March 31, 1881.
Pioche, Nev	July 29, 1877	Closed June 15, 1883.
Pittsburg, Pa	Nov. 1, 1870	
Poplar River, Mont	May 1, 1882	
Port Angeles, Wash	Feb. 1, 1885	
Port Eads, La	Apr. 10, 1881	Closed March 31, 1883.
Port Huron, Mich	July 25, 1874	
Portland, Me	Jan. 15, 1871	
Portland, Oreg	Nov. 1, 1871	
Portsmouth, N. C	Apr. 23, 1876	Closed July 31, 1883.
Prescott, Ariz	Nov. 19, 1873	
Provincetown, Mass	Feb. 15, 1882	Closed April 1, 1884.
Punta Rassa, Fla	Aug. 15, 1871	Closed June 15, 1883.
Red Bluff, Cal	July 1, 1877	Office burned August 2, 1880; re-established August 16, 1880; burned August 18, 1882; re-established Sept. 28, 1882.
Rio Grande City, Tex	May 28, 1875	Closed September 30, 1882; re-established October 1, 1883.
Rochester, N. Y	Nov. 1, 1870	Closed June 15, 1883; re-established October 10, 1883.
Roseburg, Oreg	July 15, 1877	Office burned August 19, 1884; re-established October 25, 1884.
Sacramento, Cal	July 1, 1877	
Saint Louis, Mo	Nov. 1, 1870	
Saint Marks, Fla	Nov. 10, 1874	Closed October 30, 1879.
Saint Michael's, Fort, Alaska	June 27, 1874	
Saint Paul, Minn	Nov. 1, 1870	
Saint Paul's Island, Alaska	Aug. 18, 1872	Closed December 31, 1882.
Saint Vincent, Minn	Sept. 5, 1880	
Salt Lake City, Utah	Mar. 19, 1874	
San Antonio, Tex	Sept. 22, 1875	Closed June 15, 1883; re-established January 1, 1885.
San Diego, Cal	Nov. 1, 1871	
Sandusky, Ohio	Aug. 2, 1877	Closed March 31, 1883; re-established July 20, 1883.
Sandy Hook, N. J	Dec. 10, 1873	
Sanford, Fla	Sept. 1, 1882	
San Francisco, Cal	Mar. 8, 1871	
San Luis Obispo, Cal	Jan. 27, 1885	
Santa Fé, N. Mex	Nov. 20, 1871	Closed June 15, 1883; re-established September 24, 1884.
Savannah, Ga	Jan. 1, 1871	
Shaw, Fort, Mont	Apr. 1, 1880	
Shreveport, La	Sept. 3, 1871	
Sill, Fort, Ind. T	June 23, 1875	
Silver City, N. Mex	May 15, 1878	Closed March 31, 1883.
Sitka, Alaska	Mar. 30, 1881	
Smithville, N. C	Oct. 15, 1875	
Socorro, N. Mex	July 1, 1879	Closed May 23, 1881.
Spokane Falls, Wash	Feb. 5, 1881	Office burned November 29, 1884; re-established November 30, 1884.
Springfield, Ill	July 1, 1879	
Springfield, Mass	July 19, 1873	Closed December 31, 1882.
Springfield, Mo	Jan. 3, 1882	Closed June 15, 1883.
Squan Beach, N. J	Dec. 10, 1873	Closed February 26, 1876.
Stanton, Fort, N. Mex	Jan. 1, 1885	
Stanwix, Ariz	Jan. 25, 1876	Closed December 1, 1877.
Starkville, Miss	May 4, 1882	Closed June 15, 1883.
Stevenson, Fort, Dak	Sept. 19, 1878	Closed June 15, 1883.
Stockton, Fort, Tex	Feb. 26, 1876	
Sully, Fort, Dak	May 1, 1872	Closed October 31, 1877.

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, *together with the dates on which those not in operation on June* 30, 1885, *were closed*—Continued.

Station.	Established.	Remarks.
Tatoosh Island, Wash	Oct. 1, 1883	
Thatcher's Island, Mass	Dec. 26, 1875	Closed June 1, 1883.
Thomas, Camp, Ariz	Sept. 22, 1877	
Toledo, Ohio	Nov. 1, 1870	
Totten, Fort, Dak	Oct. 8, 1883	
Tucson, Ariz	Oct. 30, 1875	Closed June 15, 1883.
Tybee Island, Ga	June 11, 1874	Closed February 15, 1879.
Umatilla, Oreg	July 15, 1877	Closed March 31, 1883.
Unalashka, Alaska	Aug. 18, 1878	
Uvalde, Tex	Sept. 6, 1875	Closed October 31, 1882.
Valentine, Nebr	Jan. 27, 1885	
Verde, Fort, Ariz	Nov. 9, 1874	Closed October 10, 1883.
Vicksburg, Miss	Sept. 10, 1871	Office burned April 21, 1885; re-established April 23, 1885.
Virginia City, Mont	Nov. 25, 1871	Closed November 18, 1880.
Visalia, Cal	July 1, 1877	Closed June 15, 1883.
Washakie, Fort, Wyo	Dec. 1, 1881	Closed June 15, 1883.
Washington City	Nov. 1, 1870	
West Las Animas, Colo	Oct. 1, 1881	
Wickenburg, Ariz	Jan. 6, 1874	Closed April 30, 1882.
Williamsport, Pa	Jan. 1, 1882	Closed June 15, 1883.
Wilmington, N. C	Jan. 1, 1871	
Winnemucca, Nev	July 1, 1877	Closed June 15, 1883; re-established October 6, 1884.
Wood's Holl, Mass	Dec. 4, 1872	Closed January 31, 1882.
Wytheville, Va	Jan. 16, 1873	Closed July 31, 1876.
Yankton, Dak	Apr. 1, 1873	
Yuma, Ariz	Nov. 18, 1873	

APPENDIX 63.

Report of the Telegraph Division for the year ending June 30, 1885.

SIGNAL OFFICE, *Washington, July* 1, 1885.

The regular tri-daily cipher weather reports were received during the year over the wires of the Western Union, International Ocean, Florida, Gulf Coast, and Northwestern Telegraph Companies.

One million six hundred and thirty-nine thousand cipher words of weather reports were received at and sent from this office during the year. Seventy thousand two hundred and twenty-five telegrams other than weather reports were sent and received during the same period.

On account of the reduced rates for Government telegrams, including the reports sent over circuits, the service was enabled to largely extend the dissemination of weather reports and forecasts for the benefit of the public.

THE SEA-COAST TELEGRAPH LINES.

The telephone wire from Sandy Hook, New Jersey, to Barnegat Inlet, New Jersey, 52 miles in length, was repaired and the telephone instruments adjusted by Sergeant Bolton during July and August, 1884; the Signal Service furnishing the line material, and the Life Saving Service paying for the hired labor. This section is operated exclusively by the Life Saving Service as a telephone line.

A new single conductor submarine cable, 3½ miles long, was laid across Ocracoke Inlet, North Carolina, on November 29, 1884.

During November and December, 1884, the line between Fort Macon, North Carolina, and Hatteras, North Carolina, 65 miles in length, was repaired and put in as good working order as the available means would permit.

On October 1, 1884, the leased wires connecting this office directly with the sea-coast lines were given up, and since that date all sea-coast telegraphic communications have been transmitted to and from this office over the wires of the Western Union Telegraph Company.

On account of the very limited appropriation for the fiscal year ending June 30, 1885, many badly needed repairs could not be made. At present two-thirds of the entire sea-coast line needs rebuilding.

THE UNITED STATES MILITARY TELEGRAPH LINES.

There have been but few changes in the military telegraph lines, built and operated by the Signal Service, since date of last report.

Lieut. M. P. Maus, First Infantry, was relieved by Lieut. R. B. Watkins, Signal Corps, as officer in charge of the California and Arizona division, on July 31, 1884; and Lieut. W. D. Wright, Signal Corps, was relieved from the charge of the Northwestern Division on May 31, 1885, and ordered to this office. The several detached sections constituting the Northwestern Division are now managed by the chief operators under the direct control of this office, except the Fort Sisseton-Webster line, which was equipped with telephones and turned over to the military authorities at Fort Sisseton.

The aggregate length of the military telegraph lines is now 2,779 miles, against 2,805 miles in operation at the date of the last report.

Only one new line was built during the year—that from Fort Laramie, Wyo., to Fort Robinson, Nebr. It was built by the labor of troops, who also cut the poles for the entire line—75 miles in length. The Signal Service furnished two expert line builders to direct and assist in the work, and all of the line material, which had been recovered from old abandoned lines. The line has worked without interruption since the date of its completion, April 18, 1885.

The abandonment of the military posts at Fort Thornburg, Utah, Fort Cummings, N. Mex., and Fort Craig, N. Mex., rendered the further maintenance of the telegraph lines to those posts unnecessary. The line between Forts Bridger and Thornburg was accordingly abandoned November 15, 1884; that between Fort Cummings and Florida Station, August 22, 1884; and that between San Marcial, via Fort Craig, to Ojo de Analla, March 20, 1885.

To provide a new and shorter outlet for Fort Stanton, N. Mex., than that to San Marcial, a short line was built between Lava, N. Mex., and Ojo de Analla, to connect at the latter point with the line to Fort Stanton. This new line, 10 miles in length, was constructed of iron poles and other material recovered from old abandoned lines, and with the assistance of a detail from Fort Stanton. It was completed March 19, 1885.

All of the abandoned sections were sold at public auction, with the approval of the honorable Secretary of War.

The lines remaining in operation are distributed between the several military departments as follows:

	Miles.
Department of Dakota	893
Department of the Missouri	582
Departments of the Columbia and California	512
Department of Arizona	510
Department of Texas	197
Department of the Platte	85
Total	2,779

The accompanying map exhibits the various sections of United States military telegraph lines now in operation, and those abandoned during former years.

The following new lines have been recommended built by the respective department commanders, and will be included in the estimates for the next fiscal year, namely:

	Miles.
From Fort Gaston, Cal., to the North Fork of Mad River, California	28
From Fort Halleck, Nev., to Halleck Station, Nev	12
Total	40

A new line was also recommended to connect Vancouver Barracks by telephone with Portland, Oreg. The material to build it was supplied by this office, but at last accounts the line had not been built, and it was doubtful whether it would be necessary.

General repairs to sections were made as follows during the year, namely:

Between Fort Apache and Fort Bowie, Ariz., during July and August, 1884. These repairs included the construction of a new iron line between Fort Grant and Wilcox, in place of the old, crooked, wooden line.

Between Fort Stanton and Fort Craig, N. Mex., during September and October, 1884. A large number of iron poles were put up in place of wooden ones; and a sufficient number of iron poles is now on hand to replace the remaining wooden poles on this section.

Between Dayton, Wash., and Fort Lapwai, Idaho, during August and September, 1884. A large number of defective poles were shortened and reset, and the whole line put in thorough repair.

Between Ashland, Oreg., and Fort Bidwell, Cal., during August and September, 1884. Details are now in the field to replace the rotten poles on this section.

All sections in Dakota and Montana were gone over by Lieutenant Wright during the fall of 1884, and general repairs made where needed.

Between Spokane Falls, Wash., and Fort Cœur d'Alene, Idaho, general repairs were made during October, 1884.

Between Brownsville and Rio Grande City, Tex., during October, 1884.

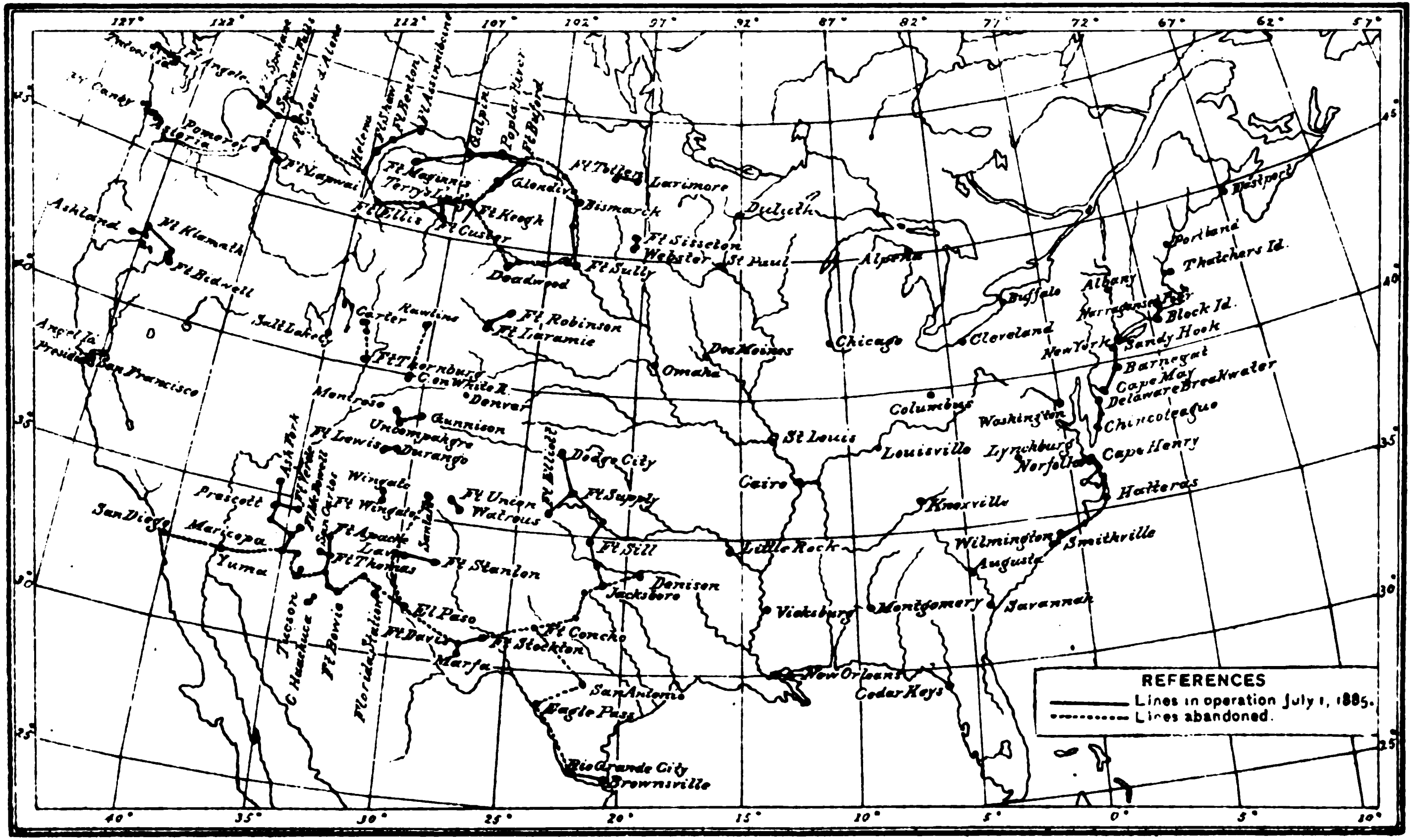
Between Helena and Fort Assinaboine, Mont., during May, 1885.

Between Fort Yates and Fort Sully, Dak., during June, 1885.

As the wooden poles on some sections have not been renewed since the lines were first built, a period of from five to eight years, it will be necessary to provide a large number of wooden or iron poles in the near future to replace the poles now rapidly going into decay.

The lines, as a whole, have worked with little more than ordinary interruptions, such as all telegraph lines are liable to. Tornadoes, floods, lightning, and malicious interference have been the principal causes of trouble. Considering that these lines run through sparsely-settled regions, where the only means of travel is by horseback or wagon, the promptness with which most repairs have been made is commendable. This is in a large measure due to the liberal assistance rendered by most department and post commanders, for whose benefit the lines are maintained. But the men detailed to make ordinary and general repairs receive no extra compensation for this arduous work. This

MAP OF U. S. MILITARY TELEGRAPH LINES.



is neither just nor conducive to that interest in and willingness to perform the work which secure the best results. The recommendation of last year that a law be obtained permitting the permanent detail of fifty enlisted men of the line of the Army for duty with the military lines, and payment of extra-duty pay to the same from line receipts, as in former years, is renewed.

Respectfully submitted.

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

Statement showing the total cash receipts and value of free business on the United States Military telegraph lines during the year ending June 30, 1885.

Division or section.	Cash receipts.		Value of free business.
	This line.	Other lines.	
California and Arizona division	$5,894 98	$11,143 36	$7,817 28
Fort Davis section	688 19	1,115 20	960 10
Brownsville section	1,110 13	615 14	946 84
Fort Stanton section	335 38	676 08	87 20
Indian Territory section	1,557 95	1,886 48	2,606 45
Fort Bridger section	96 77	166 21	87 11
Fort Robinson section*	39 21	99 45	59 47
Fort Canby section	97 84	95 27	1,645 71
Cape Flattery section	111 84	318 89	2,006 57
Fort Klamath section	567 11	734 31	333 91
Dayton section	871 25	947 36	222 57
Spokane Falls section	436 68	383 72	681 41
Fort Maginnis section	317 77	1,080 28	1,516 09
Fort Assinaboine section	1,430 83	2,056 58	1,237 27
Fort Custer section	100 45	418 75	539 09
Fort Bismarck section	255 74	482 82	910 96
Fort Totten section	24 32	134 77	79 08
Total	13,939 47	22,384 70	21,737 14

* For two and one-half months.

APPENDIX 64.

REPORT OF OFFICER IN CHARGE OF CORRESPONDENCE AND RECORDS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, August 15, 1885.

SIR: I have the honor to inclose herewith, as usually furnished by the Correspondence and Records Division, for publication in annual reports, the following, in duplicate in each case:

(1) List showing number of communications sent from and received at the Signal Office, Washington City (exclusive of telegrams), year ending June 30, 1885.

(2) List of stations inspected year ending June 30, 1885.

(3) List of places for which stations have been requested, but not established to June 30, 1885.

(4) List showing meteorological data furnished persons for purpose specified, year ending June 30, 1885.

(5) List of boards of trade, chambers of commerce, and other organizations having meteorological committees to confer with the Chief Signal Officer, June 30, 1885.

Very respectfully, your obedient servant,

B. M. PURSSELL,
Second Lieutenant, Signal Corps, United States Army.

The CHIEF SIGNAL OFFICER, *United States Army.*

APPENDIX 64 A.

Communications sent from and received at the Signal Office, Washington City (exclusive of telegrams), from July 1, 1884, *to June* 30, 1885.

SENT.

To heads of Departments and Bureaus	3,932
To non-commissioned officers in charge of stations concerning their duties	14,110
In reply to applications for establishment of stations	116
To telegraph companies in reference to transmission of weather reports, the erection of telegraph lines, &c	148
To boards of trade, chambers of commerce, &c	235
To foreign correspondents relating to simultaneous weather reports	267
To foreign correspondents in general	1,081
To voluntary observers throughout the United States	5,725
Relative to enlistments, discharges, &c	1,181
Relative to publications	1,338
Data furnished	294
To postmasters relative to Farmer's Bulletins, &c	196
To railroad companies relative to establishing stations, furnishing indications, &c	216
To Fort Myer, Virginia, concerning duties and discipline at Signal Service school of instruction	226
Relative to furnishing meteorological instruments, charts, books, forms, &c.	472
Relative to building, sale, repair, &c., of telegraph lines	133
To signal officers relative to their duties	409
Orders, circulars, instructions, &c	42,600
To manufacturers and others in reference to instruments, equipments, &c	9,072
To enlisted men in reference to property and money accounts	12,091
In reference to quarterly returns of officers, &c	3,174
Authorizing purchases and expenditures	2,573
Miscellaneous	8,993
Total	108,582

RECEIVED.

From heads of Departments and Bureaus	6,938
Applications for establishment of new stations	35
From telegraph companies in reference to the transmission of weather reports and the construction of telegraph lines, &c	183
From boards of trade, chambers of commerce, &c	289
From foreign correspondents	7,099
Surgeons' certificates	670
Examination papers	133
From enlisted men in reference to their duties	10,516
Returns, accounts, descriptive lists, &c	1,301
From United States naval stations and vessels	1,932
From voluntary observers throughout the United States	3,991
From United States military posts (surgeons' reports)	574
Relating to duties and discipline at Signal Service school of instruction at Fort Myer, Virginia	251
Relating to instruction in military signaling	77
Applications for enlistment	574
Instruction reports	2,167
Reports from railroad stations in reference to weather reports	20,507
Meteorological forms, &c., from stations	213,182
Reports from postmasters in reference to weather bulletins	103,952
Acknowledgments of orders, circulars, &c.	17,000
From manufacturers and others in reference to instruments, equipments, &c.	5,253
From officers concerning property, quarterly returns, &c.	5,856
From enlisted men relating to property and money accounts	24,917
Miscellaneous	10,730
Total	438,127
Total sent	108,582
Total sent and received	546,709

TELEGRAMS.

Cipher words of weather reports sent and received	1,639,000
Telegrams other than weather reports sent and received	70,225

APPENDIX 64 B.

Stations inspected year ending June 30, 1885.

Station.	Inspected by—	Date of inspection.
Albany, N. Y	Lieut. F. R. Day, Signal Corps, U. S. A	March 29, 30, 1885.
Alpena, Mich	do	April 24, 1885.
Apache, Fort, Ariz	Lieut. R. B. Watkins, Signal Corps, U. S. A	November 11, 12, 1884.
Assinaboine, Fort, Mont	Lieut. W. D. Wright, Signal Corps, U. S. A	November 11, 12, 1884.
Atlanta, Ga	Lieut. J. C. Walshe, Signal Corps, U. S. A	March 20, 21, 1885.
Augusta, Ga	do	March 22, 23, 1885.
Baltimore, Md	Lieut. J. P. Finley, Signal Corps, U. S. A	March 9, 10, 1885.
Bennett, Fort, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A	September 28, 1884.
Benton, Fort, Mont	do	November 9, 1884.
Bidwell, Fort, Cal	Lieut. Frank Greene, Signal Corps, U. S. A	July 17, 1884.
Bismarck, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A	January 6–8, 1885.
Block Island, R. I	Lieut. F. R. Day, Signal Corps, U. S. A	March 12, 13, 1885.
Boisé City, Idaho	Lieut. Frank Greene, Signal Corps, U. S. A	July 14, 1884.
Bowie, Fort, Ariz	Lieut. R. B. Watkins, Signal Corps, U. S. A	October 24, 1884.
Boston, Mass	Lieut. F. R. Day, Signal Corps, U. S. A	March 15–19, 1885.
Buffalo, N. Y	do	April 8, 9, 1885.
Brownsville, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A	March 14, 15, 1885.
Buford, Fort, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A	October 13, 1884.
Burlington, Iowa	Lieut. J. P. Finley, Signal Corps, U. S. A	May 7, 8, 1885.
Cape Mendocino, Cal	Lieut. Frank Greene, Signal Corps, U. S. A	July 29–31, 1884.
Cape Henry, Va	Lieut. J. C. Walshe, Signal Corps, U. S. A	March 5, 6, 1885.
Cairo, Ill	do	May 8, 9, 1885.
Cape Lookout, N. C	do	May 27, 28, 1885.

Stations inspected year ending June 30, 1885—Continued.

Station.	Inspected by—	Date of inspection.
Cedar Keys, Fla	Lieut. J. C. Walshe, Signal Corps, U. S. A	April 1–3, 1885.
Charlotte, N. C	do	March 17, 18, 1885.
Chattanooga, Tenn	do	May 12, 13, 1885.
Cheyenne, Wyo	Lieut. J. P. Finley, Signal Corps, U. S. A	April 20–23, 1885.
Chicago, Ill	Lieut. F. R. Day, Signal Corps, U. S. A	May 11–13, 1885.
Charleston, S. C	Lieut. J. C. Walshe, Signal Corps, U. S. A	March 24–26, 1885.
Cincinnati, Ohio	Lieut. J. P. Finley, Signal Corps, U. S. A	March 18, 19, 1885.
Cleveland, Ohio	Lieut. F. R. Day, Signal Corps, U. S. A	April 11–13, 1885.
Concho, Fort, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A	February 13–15, 1885.
Custer, Fort, Ariz	Lieut. W. D. Wright, Signal Corps, U. S. A	October 30, 31, 1884.
Columbus, Ohio	Lieut. J. P. Finley, Signal Corps, U. S. A	March 15–17, 1885.
Colorado Springs, Colo	do	April 10–17, 1885.
Craig, Fort, N. Mex	Lieut. R. B. Watkins, Signal Corps, U. S. A	November 2, 1884.
Davis, Fort, Tex., and Marfa.	Lieut. W. A. Glassford, Signal Corps, U. S. A	February 23–27, 1885.
Davenport, Iowa	Lieut. J. P. Finley, Signal Corps, U. S. A	May 2–4, 1885.
Deadwood, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A	October 5, 1884.
Des Moines, Iowa	Lieut. J. P. Finley, Signal Corps. U. S. A	April 30 to May 2, 1885.
Detroit, Mich	Lieut. F. R. Day, Signal Corps, U. S. A	April 16, 17, 1885.
Denver, Colo	Lieut. J. P. Finley, Signal Corps, U. S. A	April 17–20, 1885.
Dodge City, Kans	Lieut. W. A. Glassford, Signal Corps, U. S. A	April 27, 28, 1885.
Dubuque, Iowa	Lieut. J. P. Finley, Signal Corps, U. S. A	May 5–7, 1885.
Duluth, Minn	Lieut. F. R. Day, Signal Corps, U. S. A	May 7, 8, 1885.
El Paso, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A	February 5–10, 1885.
Erie, Pa	Lieut. F. R. Day, Signal Corps, U. S. A	April 10, 1885.
Escanaba, Mich	do	May 1, 2, 1885.
Elliott, Fort, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A	April 22, 23, 1885.
Glendive, Mont	Lieut. W. D. Wright, Signal Corps, U. S. A	October 10, 1884.
Grant, Fort, Ariz	Lieut. R. B. Watkins, Signal Corps, U. S. A	October 25, 26, 1884.
Greencastle, Ind	Lieut. J. P. Finley, Signal Corps, U. S. A	March 24, 25, 1885.
Galveston, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A	March 26–28, 1885.
Grand Haven, Mich	Lieut. F. R. Day, Signal Corps, U. S. A	May 14, 1885.
Helena, Mont	Lieut. W. D. Wright, Signal Corps, U. S. A	November 3–19, 1884.
Huron, Dak	do	December 16, 17, 1884.
Hatteras, N. C	Lieut. J. C. Walshe, Signal Corps, U. S. A	May 23–25, 1885.
Indianapolis, Ind	Lieut. J. P. Finley, Signal Corps, U. S. A	March 22–24, 1885.
Indianola, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A	March 22–24, 1885.
Jacksonville, Fla	Lieut. J. C. Walshe, Signal Corps, U. S. A	March 29–31, 1885.
Key West, Fla	do	April 9–11, 1885.
Keokuk, Iowa	Lieut. J. P. Finley, Signal Corps, U. S. A	May 8–10, 1885.
Knoxville, Tenn	Lieut. J. C. Walshe, Signal Corps, U. S. A	May 14, 15, 1885.
Kitty Hawk, N. C	do	May 20, 21, 1885.
Los Angeles, Cal	Lieut. R. B. Watkins, Signal Corps, U. S. A	October 1, 2, 1884.
Louisville, Ky	Lieut. J. P. Finley, Signal Corps, U. S. A	March 19–21, 1885.
Leavenworth, Kans	do	March 30, April 1–3, 1885.
Lamar, Mo	Lieut. W. A. Glassford, Signal Corps, U. S. A	May 1, 2, 1885.
La Crosse, Wis	Lieut. F. R. Day, Signal Corps, U. S. A	May 5, 1885.
Little Rock, Ark	Lieut. W. A. Glassford, Signal Corps, U. S. A	May 7–9, 1885.
Lynchburg, Va	Lieut. J. C. Walshe, Signal Corps, U. S. A	May 16, 17, 1885.
Maricopa, Ariz	Lieut. R. B. Watkins, Signal Corps, U. S. A	September 28, 1884.
McDowell Fort, Ariz	do	September 26, 1884.
Maginnis Fort, Mont	Lieut. W. D. Wright, Signal Corps, U. S. A	October 24–26, 1884.
Moorhead, Minn	Lieut. W. D. Wright, Signal Corps, U. S. A	December 2, 3, 1884.
Mount Washington, N. H	Lieut. F. R. Day, Signal Corps, U. S. A	March 22, 23, 1885.
Montgomery, Ala	Lieut. J. C. Walshe, Signal Corps, U. S. A	April 19–21, 1885.
Mobile, Ala	do	April 22–24, 1885.
Mackinaw City, Mich	Lieut. F. R. Day, Signal Corps, U. S. A	April 28, 1885.
Marquette, Mich	do	April 30, May 1, 1885.
Milwaukee, Wis	do	May 3, 4, 1885.
Memphis, Tenn	Lieut. J. C. Walshe, Signal Corps, U. S. A	May 5–7, 1885.
Macon, Fort, N. C	do	May 28, 29, 1885.
New York City	Lieut. F. R. Day, Signal Corps, U. S. A	March 3–5, 1885.
Norfolk, Va	Lieut. J. C. Walshe, Signal Corps, U. S. A	March 3, 4, 1885.
New Haven, Conn	Lieut. F. R. Day, Signal Corps, U. S. A	March 7–9, 1885.
New London, Conn	do	March 9, 10, 1885.
Narragansett Pier, R. I	do	March 11, 1885.
New River Inlet, N. C	Lieut. J. C. Walshe, Signal Corps, U. S. A	March 12–14, 1885.
North Platte, Nebr	Lieut. J. P. Finley, Signal Corps, U. S. A	April 23–25, 1885.
New Orleans, La	Lieut. J. C. Walshe, Signal Corps, U. S. A	April 25–28, 1885.
New Orleans, La. (exposition building).	do	April 29, 30, 1885.
Nashville, Tenn	do	May 10, 11, 1885.
Oswego, N. Y	Lieut. F. R. Day, Signal Corps, U. S. A	March 31, April 1, 1885.
Omaha, Nebr	Lieut. J. P. Finley, Signal Corps, U. S. A	April 25–30, 1885.
Poplar River, Mont	Lieut. W. D. Wright, Signal Corps, U. S. A	October 15, 1884.
Phœnix, Ariz	Lieut. R. B. Watkins, Signal Corps, U. S. A	September 26, 1884.
Prescott, Ariz	do	November 21, 22, 1884.
Point Judith, R. I	Lieut. F. R. Day, Signal Corps, U. S. A	March 11, 1885.
Pittsburg, Pa	Lieut. J. P. Finley, Signal Corps, U. S. A	March 12, 13, 1885.
Portland, Me	Lieut. F. R. Day, Signal Corps, U. S. A	March 26, 27, 1885.
Pensacola, Fla	Lieut. J. C. Walshe, Signal Corps, U. S. A	April 16, 17, 1885.
Port Huron, Mich	Lieut. F. R. Day, Signal Corps, U. S. A	April 20, 21, 1885.
Pike's Peak, Colo	Lieut. J. P. Finley, Signal Corps, U. S. A	April 10–17, 1885.

Stations inspected year ending June 30, 1885—Continued.

Station.	Inspected by—	Date of inspection.
Portsmouth, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 25, 26, 1885.
Palestine, Tex.	Lieut. W. A. Glassford, Signal Gorps, U. S. A.	March 30, 31, 1885.
Red Bluff, Cal.	Lieut. Frank Greene, Signal Corps, U. S. A.	August 5–7, 1884.
Rio Grande City, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 11, 12, 1885.
Rochester, N. Y.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 2, 3, 1885.
Reno, Fort, Ind. T	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 13, 14, 1885.
Salt Lake City, Utah	Lieut. Frank Greene, Signal Corps, U. S. A.	July 9–11, 1884.
Sacramento, Cal	do	July 21, 22, 1884.
Sully, Fort, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A	September 26, 1884.
San Diego, Cal	Lieut. R. B. Watkins, Signal Corps, U. S. A.	October 3, 1884.
San Carlos, Ariz	do	October 29, 1884.
San Marcial N. Mex.	do	November 2, 1884.
Stanton, Fort, N. Mex	do	November 5, 6, 1885.
Shaw, Fort, Mont	Lieut. W. D. Wright, Signal Corps, U. S. A	November 7, 1884.
Saint Vincent, Minn	do	December 4, 5, 1884.
Sisseton, Fort, Dak.	do	December 14, 1884.
Santa Fé, N. Mex	Lieut. W. A. Glassford, Signal Corps, U. S. A.	January 30, 31, February 1, 2, 1885.
Stockton, Fort, Tex	do	February 19–21, 1885.
Smithville, N. C	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 9, 10, 1885.
San Antonio, Tex	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 3–6, 1885.
Scott's Hill, N. C	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 11, 12, 1885.
Saint Louis, Mo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 26–29, 1885.
Savannah, Ga	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 27–29, 1885.
Shreveport, La	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 2, 3, 1885.
Sanford, Fla	Lieut. J. C. Walshe, Signal Corps, U. S. A.	April 5, 6, 1885.
Sill. Fort, Ind. T	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 7–9, 1885.
Sandusky, Ohio	Lieut. F. R. Day, Signal Corps, U. S. A.	April 13, 14, 1885.
Supply, Fort. Ind. T.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 20, 1885.
Saint Paul, Minn	Lieut. F. R. Day, Signal Corps, U. S. A.	May 6, 1885.
Smith, Fort, Ark	Lieut. W. A. Glassford, Signal Corps, U. S. A.	May 5, 6, 1885.
Springfiel[illegible] Ill	Lieut. J. P. Finley, Signal Corps, U. S. A.	May 12–14, 1885.
Terry's Landing, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 21, 1884.
Thomas, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	October 27, 28, 1884.
Totten, Fort, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A.	December 8, 1884.
Toledo, Ohio	Lieut. F. R. Day, Signal Corps, U. S. A.	April 14, 15, 1885.
Verde, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 22, 1884.
Vicksburg, Miss	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 2–4, 1885.
Wickenburg, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 25, 1884.
Willcox, Ariz	do	October 23, 1884.
Watrous, N. Mex	Lieut. W. A. Glassford, Signal Corps, U. S. A.	January 27, 1885.
Wilmington, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 7–9, 1885.
West Las Animas, Colo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 7–10, 1885.
Yates, Fort, Dak	Lieut. W. D. Wright, Signal Corps, U. S. A.	September 15, 1884.
Yuma, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 29–30, 1884.
Yankton, Dak.	Lieut. W. D. Wright, Signal Corps, U. S. A.	December 19, 1884.

APPENDIX 64 C.

List of places for which stations have been requested but not established to June 30, 1885.

Place.	Date.	Place.	Date.
Alabama:		California:	
Auburn (Agricultural and Mechanical College).	May 14, 1872	Bakersfield	May 14, 1874
		Cheyenne Wells	July 27, 1877
	Dec. 23, 1880	Oakland (University of California).	Mar. 12, 1881
	Jan. 4, 1881		
Coffeeville	Dec. 20, 1882		Apr. 15, 1884
Eutaw	July 20, 1872		Apr. 5, 1885
Florence	Apr. 20, 1880	Table Mountain	Oct. 4, 1883
Friendville	Nov. 6, 1875	Tulose	June 29, 1884
Marion	Oct. 16, 1881	Wilmington	Jan. 4. 1881
Trinity	Mar. 4, 1882	Colorado:	
Arkansas:		Fountain	Dec. 4, 1871
Fayetteville (Arkansas Industrial University).	Feb. 17, 1874	Leadville	June 17, 1880
			Feb. 9, 1881
	Sept. 28, 1881	Mount Massive	Feb. 23, 1882
Fulton	Dec. 23, 1875	Summit	Jan. 7, 1880
	Dec. 21, 1879	The Parks of Colorado	May 24, 1871
Hot Springs	Aug. 2, 1881	Connecticut:	
	Dec. 10, 1877	Hartford	Jan. 21, 1875
Indsonia University	Aug. 18, 1877	Mohawk Mountain	Oct. 14, 1882
	July 6, 1878	Race Rock Light-house	Nov. 20, 1880

List of places for which stations have been requested, &c.—Continued.

Place.	Date.
Connecticut—Continued.	
The National Park	Nov. 7, 1880
Yale College	Jan. 30, 1885
Dakota:	
Aberdeen	Feb. 18, 1882
Chamberlain	June 22, 1882
	July 17, 1882
	Nov. 15, 1882
Lisbon	Nov. 16, 1882
Pierre	Jan. 5, 1883
Randall, Fort	Nov. 9, 1871
Richardton	Dec. 6, 1883
Thompson, Fort	June 18, 1874
Young Man's Butte	Dec. 6, 1883
Delaware:	
Newark (Delaware College)	Jan. 11, 1872
Ocean View	Apr. 16, 1884
Wilmington	June 24, 1872
Florida:	
Apalachicola	Sept. 10, 1883
Fort Jupiter Light	Dec. 27, 1881
	Dec. 31, 1881
	June 14, 1882
	Feb. 4, 1882
Lawtey	Oct. 27, 1882
Palatka	Feb. 17, 1873
Tallahassee	Jan. 12, 1875
Three or four additional stations in the interior of the State.	May 6, 1875
Titusville	No date.
Georgia:	
Doboy Island	Jan, 25, 1879
New Switzerland	Feb. 3, 1882
Rome	Apr. 24, 1874
	Jan. 21, 1875
	Dec. 4, 1875
	Mar. 31, 1876
	Mar. 16, 1877
	July 19, 1878
Idaho:	
Franklin	July 23, 1875
Silver City	Feb. 9, 1876
Illinois:	
Abingdon (Abingdon College)	Apr. 1, 1875
Bloomington	Aug. 30, 1874
Carbondale (Southern Illinois Normal University).	Oct. 1, 1878
	Oct. 2, 1878
Carthage	Sept. 2, 1872
Decatur	Aug. 30, 1874
Galena	Sept. 14, 1871
Grand Tower	Mar. 21, 1872
Grayville	June 7, 1878
Jacksonville	Mar. 15, 1875
Metamora	Aug. 8, 1871
Pana	Jan. 17, 1875
Princeton	Aug. 11, 1871
Peoria	Dec. 22, 1884
Quincy	Jan. 4, 1872
	July 25, 1879
	Dec. 8, 1879
	Jan. 7, 1885
Sandwich	Jan. 22, 1873
Indiana:	
Crawfordsville (Wabash College).	June 6, 1874
Evansville	Dec. 2, 1884
Fort Wayne	Apr. 12, 1872
Lafayette (Purdue University)	Apr. 14, 1879
Leavenworth	Oct. 13, 1882
New Albany	Apr. 12, 1872
Nobleville	July 27, 1883
Richmond	Aug. 20, 1881
Rockville	Dec. 8, 1883
Vincennes	June 15, 1873
Iowa:	
Afton	Feb. 17, 1875
Algona	Feb. 14, 1878
Ames (State Agricultural College).	Jan. 23, 1878
Cedar Rapids	Feb. 11, 1881
Council Bluffs	Mar. 9, 1885
Iowa—Continued.	
Fort Dodge	Nov. 4, 1875
Iowa City (State University)	Dec. 14, 1871
	Jan. 6, 1878
	Jan. 3, 1875
Mason City	Oct. 6, 1871
	Dec. 11, 1882
Monticello	Apr. 15, 1877
Sheldon	July 18, 1881
Sioux City	July 18, 1881
Spirit Lake	June 6, 1885
Kansas:	
Ellsworth	July 14, 1874
	July 21, 1874
	Mar. 6, 1873
Emporia (State Normal School)	Feb. 2, 1881
Gaylord	Dec. 27, 1879
Grainfield	Mar. 3, 1882
Holton	Sept. 23, 1884
Lawrence (University of Kansas).	Jan. 16, 1873
	May 6, 1873
	Jan. 7, 1881
On plains of Western Kansas and regions to southward and westward.	Dec. 21, 1872
Salina	July 17, 1873
	Apr. 2, 1877
Sherlock	July 9, 1884
Towanda	Feb. 12, 1872
Wichita	July 12, 1882
Kentucky:	
Anchorage	Mar. 31, 1877
Carrollton	Mar. 6, 1881
Central University, Richmond	Sept. 11, 1885
Lexington	Apr. 22, 1882
	May 13, 1885
Richmond	Apr. 22, 1884
Louisiana:	
Balize	Oct. 31, 1871
Baton Rouge (State University and Agricultural and Mechanical College).	Feb. 25, 1881
Lake Charles	June 12, 1873
	Oct. 15, 1877
Southwest Pass (Pass à l'Outre)	Mar. 20, 1871
Maine:	
Augusta (United States arsenal).	Feb. 16, 1883
Belfast	Aug. 6, 1872
Calais	June 16, 1874
Crumples Island	Dec. 4, 1881
	Dec. 10, 1881
	Feb. 8, 1884
Cutler	Apr. 3, 1882
Green Mountain	Sep. 21, 1882
Orono (State Agricultural College).	Oct. 19, 1871
	Feb. 17, 1873
Penobscot Bay (entrance)	Jan. 19, 1882
White Head	Feb. 28, 1881
Maryland:	
State Agricultural College	Apr. 18, 1872
	June 21, 1872
Annapolis	July 28, 1884
Massachusetts:	
Amherst (State Agricultural College).	Mar. 30, 1878
Nantucket	Mar. 6, 1881
Pittsfield	Dec. 20, 1879
South Framingham	Apr. 18, 1881
State arsenal	July 23, 1881
	Aug. 22, 1881
Vineyard Haven	Dec. 18, 1871
Michigan:	
Ann Arbor (University of Michigan).	Nov. 26, 1871
Eagle River	Jan. 21, 1882
Glen Haven	June 11, 1881
	Dec. 4, 1881
	Mar. 4, 1882
Hillsdale	Aug. 6, 1871
Huron City	Jan. 27, 1871
	Feb. 19, 1871

List of places for which stations have been requested, &c.—Continued.

Place.	Date.
Michigan—Continued.	
Lansing (State Agricultural College).	Jan. 12, 1875
	Dec. 18, 1883
	Dec. 22, 1884
Leland	Feb. 25, 1882
Manitou Island	Oct. 24, 1881
Niles	July 27, 1881
Paw-Paw	Apr. 8, 1876
Port Hope	July 22, 1871
Three Rivers	May 30, 1873
White Hall	Mar. 29, 1879
	Oct. 6, 1879
Minnesota:	
Breckinridge	Feb. 17, 1881
Detroit	Feb. 2, 1873
Minneapolis (University of Minnesota).	Feb. 21, 1872
Minneiska	Mar. 16, 1885
New Ulm	July 10, 1872
	Dec. 15, 1881
Northfield (Carleton College)	May 28, 1879
	Nov. 19, 1880
Reed's Landing	June 25, 1877
Mississippi:	
Chatawa (College of the Redemptionist Fathers).	July 13, 1874
Iuka	Mar. 25, 1872
Macon	Jan. 9, 1881
Starkville	June 25, 1884
Winona	July 20, 1882
Agricultural and Mechanical College.	June 19, 1885
Missouri:	
Brunswick	June 4, 1885
Carthage	Aug. 15, 1873
Dromore	Jan. 27, 1883
Glasgow	Mar. 8, 1880
Killingham	Mar, 21, 1884
Louisiana	Aug. 31, 1871
	Jan. 4, 1882
Mason City	Mar. 30, 1874
Pierce City	Apr. 9, 1873
	Nov. 10, 1880
	Feb. 17, 1885
Rolla (Missouri School of Mines).	May 5, 1880
Saint Joseph (University of Missouri).	July 17, 1876
	Jun. 22, 1882
	Mar. 15, 1883
Saint Louis (College of the Christian Brothers).	Mar. 12, 1884
Springfield	Feb. 9, 1884
West Plains	Aug. —, 1884
Montana:	
Bedford	Apr. 10, 1881
Butte	Oct. 11, 1879
Etchetah	Oct. 21, 1881
Livingston	Mar. 15, 1883
Missoula	June 26, 1882
Wolf Point	June 16, 1882
Nebraska:	
Beatrice	Mar. 3, 1874
Columbus	Sept. 5, 1871
Fairbury	May 12, 1876
Lincoln	Mar. 4, 1884
Nebraska City	Aug. 14, 1874
Nevada:	
Carson City	Mar. 6, 1876
New Jersey:	
Camden (The River Iron Works)	July 29, 1874
Neshanic Mountains (Somerset County).	Apr. 12, 1873
Somerset County (latitude, 40° 30′; longitude 74° 42′).	Dec. 22, 1873
New Hampshire:	
Dover Point	Jan. 13, 1872
Gorham	Mar. 30, 1874
Isles of Shoals	Sept. 10, 1879
Manchester	Jan. 21, 1873
Milton	Jan. 8, 1883
Mount Kearsarge	Oct. 28, 1874
Mount Massilank	Aug. 16, 1871
New Mexico:	
Cimarron	Dec. 3, 1880
New York:	
Alfred Centre (Alfred University).	Jan. 12, 1877
Catskill Mountains	June 21, 1883
Deposit	Apr. 1, 1872
Ithaca (Cornell University)	Aug. 3, 1872
	Nov. 18, 1872
	Nov. 22, 1872
	Jan. 25, 1873
	Jan. 8, 1875
	Mar. 17, 1875
	Apr. 17, 1875
	May 7, 1878
	Aug. 8, 1878
Long Beach (Long Island)	Oct. 16, 1880
Ogdensburg	May 25, 1872
Overlook Mountains	Mar. 7, 1879
Plattsburg	May 28, 1872
Port Jervis	Nov. 8, 1881
Saratoga Springs	Aug. 23, 1884
Sodus Point	Feb. 14, 1883
Starkey	Aug. 8, 1878
Staten Island	June 9, 1871
	June 20, 1871
Suspension Bridge (Seminary of our Lady of Angels).	May 14, 1880
Syracuse	May 9, 1874
	May 11, 1874
The Vista (Catskill Mountains).	Feb. 6, 1878
Ticonderoga	Feb. 21, 1882
Watertown	June 21, 1871
	June 21, 1873
	Mar. 9, 1876
Whitestone (Long Island)	Dec. 29, 1881
North Carolina:	
Alleghany Mountains	July 26, 1873
Asheville	May 13, 1885
Beaufort	Feb. 15, 1881
	Feb. 15, 1881
	July 24, 1882
Black Dome (Black Mountains).	Feb. 12, 1872
	Dec. 10, 1880
	Jan. 28, 1881
Body Island	Apr. 17, 1871
Chadbourne	July 4, 1883
Danville (Mocksville and Southwestern Railroad).	July 29, 1881
Great Natshalee (Bald Mountains).	Apr. 1, 1872
Hibritten Mountains	Jan. 28, 1881
Highlands	Dec. 13, 1881
	Dec. 29, 1881
	Dec. 30, 1881
	Feb. 12, 1884
Lenoir	July 23, 1875
Mount Mitchell	Aug. 29, 1878
Mount Stooley	Oct. 19, 1882
Ocracoke	June 29, 1877
Roane Mountain	July 19, 1878
Smead's Ferry	Mar. 14, 1885
Statesville	Nov. 17, 1877
	Jan. 29, 1879
Swansborough	Sept. 4, 1879
Winston	Mar. 17, 1880
Ohio:	
Dayton (National Soldiers' Home).	Feb. 11, 1873
	Feb. 1, 1875
Gallipolis	Feb. 10, 1885
Hillsborough	Sept. 3, 1881
Ironton	Mar. 25, 1875
Kelly's Island	May 25, 1876
	Dec. 17 1879
	Aug. 19, 1880
Oxford	Feb. 22, 1882
	Aug. 5, 1882
Springfield	Feb. 7, 1881
University of Ohio, Columbus	June 23, 1885
Xenia	June 30, 1871
Yellow Springs	Feb. 4, 1885

List of places for which stations have been requested, &c.—Continued.

Place.	Date.
Oregon:	
Baker City	Feb. 9, 1876
Corvallis	Jan. 17, 1884
Point Adams	Aug. 26, 1880
Tillamook Rock	Aug. 26, 1880
	Dec. 27, 1880
	Jan. 3, 1881
	June 20, 1881
	Jan. 31, 1882
	Mar. 8, 1882
Pennsylvania:	
Altoona	Feb. 17, 1872
Berks (summit of Blue Ridge Mountains).	Sept. 9, 1881
Carlisle	May 4, 1876
Catasauqua	Sept. 11, 1871
Chambersburg	June 12, 1871
Cresson	Jan. 10, 1885
Easton	Aug. 15, 1871
Franklinville	Dec. 1, 1882
Gallatin	Feb. 17. 1872
Greensborough	Dec. 28, 1872
	Jan. 10, 1873
Harrisburg	Aug. 15, 1871
	Feb. 26, 1881
	Oct. 29, 1881
Heilmandale	Apr. 1, 1872
Hummelstown	June 10, 1879
Kutztown (Keystone State Normal School).	Sept. 13, 1872
Locust Mountain	Nov. 20, 1884
Media	Oct. 1, 1883
Mount Pisgah (Bradford County).	Mar. 2, 1875
Mount Pleasant (Mount Pleasant Academy).	Aug. 11, 1871
Tionesta	Feb. 9, 1884
Wilkesbarre	Apr. 8, 1881
South Carolina:	
Aiken	July 16, 1872
	Sept. 2, 1872
	Mar. 31, 1875
Georgetown	Aug. 22, 1884
Laurens	No date.
Tennessee:	
Bristol	Aug. 15, 1871
Clarksville	Dec. 21, 1881
Moffat	June 29, 1876
Sewanee (University of the South).	June 10, 1872
	June 26, 1877
	Apr. 22, 1881
	Dec. 17, 1881
	Oct. 17, 1884
Tennessee Ridge	June 13, 1883
Texas:	
Abilene	Feb. 26, 1884
Belton	May 28, 1879
Caddo Peak	Nov. 28, 1883
Comfort	Sept. 2, 1880
	Sept. 6, 1880
	Nov. 15, 1880
Corpus Christi	Mar. 24, 1885
Fort Worth	May 25, 1881
Galveston (north and west of)	Mar. 6, 1873
Lampassas	Feb. 14, 1883
San Antonio	July 1, 1884
Utah:	
Beaver City	July 8, 1872
Ogden	Apr. 26, 1879
Vermont:	
Ascutney Mountain	May 24, 1881
Vermont—Continued.	
Bennington (Mount Anthony)	Jan. 27, 1875
Burlington	July 1, 1884
Northfield (Norwich University).	Mar. 15, 1872
Mount Killington	Dec. 17, 1884
Mount Mansfield	Dec. 25, 1884
Randolph (State Normal School).	Mar. 14, 1881
Stowe	Dec. 22, 1876
Virginia:	
Bald Knob (Giles County)	July 21, 1874
	Dec. 22, 1876
Blacksburg	Dec. 22, 1883
Charlottesville (University of Virginia).	Mar. 2, 1878
Christianburg	Aug. 15, 1871
Danville	Dec. 13, 1875
	July 15, 1879
	May 23, 1882
Elliott's Knob	May 23, 1879
Manassas	Dec. 27, 1871
Mountains (additional stations on).	May 17, 1871
Mount Lake	July 21, 1874
Richmond	Apr. 8, 1871
Staunton	Aug. 15, 1871
	Oct. 9, 1882
Winchester	Aug. 15, 1871
Washington Territory:	
Cape Disappointment	Sept. 30, 1873
	Dec. 9, 1881
Cape Hancock	Feb. 12, 1882
Port Townsend	Mar. 8, 1878
	Dec. 16, 1878
	Dec. 17, 1878
	Mar. 5, 1880
Seattle	Oct. 26, 1878
Semiahmoo	No date.
Walla Walla	Feb. 9, 1876
West Virginia:	
Corado	June 10, 1876
	Nov. 21, 1876
Maywood	Oct. 15, 1883
Wisconsin:	
Bailey's Harbor	Feb. 16, 1883
	Apr. 16, 1882
	Jan. 8, 1883
	Mar. 25, 1885
Carlton	Jan. 10, 1874
	Jan. 26, 1874
Fond du Lac	Dec. 15, 1874
Hingham	Apr. 19, 1875
Janesville	Aug. 7, 1881
Mineral Point	Dec. 1, 1873
Oshkosh	Jan. 22, 1875
Palmyra	May 19, 1874
Prairie du Chien	Feb. 27, 1884
Ripon (Ripon College)	July 21, 1877
	Feb. 5, 1878
	Feb. 29, 1878
Wyoming:	
Fred Steele, Fort	Feb. 24, 1881
Miscellaneous:	
Atlantic Ocean	Aug. 12, 1882
Chippewayan, Fort (Canada)	Sept. 11, 1882
Havana, Cuba	Sept. 14, 1882
Prince Albert (North Saskatchewan River, Manitoba).	Aug. 31, 1882
State Agricultural College	Feb. 29, 1872

APPENDIX 64 D.

Meteorological data were furnished 208 different persons during the year ending June 30, 1885, at their request, for the following purposes, viz:

To be used in State or United States courts as evidence.

To be used in compiling works or publications on meteorology, hygiene, agriculture, manufactures, commerce, &c.

To assist in manufactures, the prosecution of the arts, and advancement of the sciences.

To settle questions as to the relations of meteorology and agriculture.

In deciding the cause and locating the responsibility in railroad and marine disasters.

In fixing the responsibility of damage to freight in transit by common carriers.

In acquainting immigrants with the climatology of districts open to settlement.

In informing invalids of the desirability of the meteorology of sections affecting their diseases.

Miscellaneous purposes.

APPENDIX 64 E.

List of boards of trade, chambers of commerce, and other organizations which had on June 30, 1885, meteorological committees to confer with the Chief Signal Officer of the Army.

Place.	Name of organization.	Committee.
Albany, N. Y	Board of Trade	Charles B. Tillinghast, J. Townsend Lansing, Walter McEwan.
Alpena, Mich	Board of Underwriters	Henry S. Seage, John N. Kelley, J. D. Holmes, B. F. Luce, Charles H. Luce.
Astoria, Oreg	Chamber of Commerce	Dr. A. C. Kinney.
Atlanta, Ga	Board of Trade and Academy of Science.	B. W. Frobel, J. T. Henderson, R. J. Redding.
Augusta, Ga	Cotton Exchange	G. W. Crane, J. M. Anderson, J. J. Dicks.
Baltimore, Md	Board of Trade	George J. Appold, D. L. Bartlett, Germon H. Hunt, Frank H. Jenkins, D. T. Buzby.
Block Island, R. I.		B. B. Mitchell, Ray S. Littlefield, Charles E. Perry.
Boston, Mass	Society of Arts	Prof. William H. Niles, Jacob A. Dresser, George L. Roberts.
Buffalo, N. Y	Merchants' Exchange	Nathan C. Simons, Frank W. Fiske, Charles H. Arthur.
Charleston, S. C	Chamber of Commerce	C. Gravely, F. W. Dawson, A. D. Cohen.
Do	Merchants' Exchange	George W. Bell, T. Follett Ware, John Dougherty.
Charlotte, N. C	Chamber of Commerce	T. F. Drayton, S. A. Cohen, W. W. Flemming.
Chattanooga, Tenn	Iron, Coal, and Manufacturers' Association.	D. W. Chase, J. F. Bennett, A. M. Johnson, S. R. Read, C. E. James. T. A. Snow, G. G. Moore.
Chicago, Ill	Board of Trade	W. S. Seavers, W. D. Gregory.
Cincinnati, Ohio	Board of Trade and Transportation Committee.	T. E. Livezey, George C. Clements, Charles H. Law, Alexander Hill, A. M. Dolph.
Cleveland, Ohio	Board of Trade	R. T. Lyon, Capt. W. B. Guyles, R. K. Winslow.
Columbus, Ohio	Board of Trade	George W. Twiss, George Cole, J. B. K. Conelly.
Concordia, Kans		B. H. McEckron, Theo. Laing, Prof. T. A. Sawhill.
Denver, Colo	Chamber of Commerce	Charles F. Wilson, Ed. L. Scholtz, J. B. Reverdy, Samuel A. Fisk, M. D.; L. E. Lemon, M. D.; J. H. Kimball.
Des Moines, Iowa	Board of Trade	J. P. Bushnell, secretary; S. A. Robertson, W. A. Warfield.
Detroit, Mich	Board of Trade	T. P. Hall, J. W. Flynn.
Dubuque, Iowa	Board of Trade	Dr. A. Horr, T. W. Ruete, S. M. Langworthy.
Duluth, Minn	Board of Trade.	Walter Van Brunt, Owen Fargueson, Benj. R. Clarkson.
Erie, Pa	Board of Trade	H. S. Jones, Jos. Johnston, Charles Jarecki.
Grand Haven, Mich		Hon. Dwight Cutler, T. W. Kirby, William Wallace.
Huron, Dak	Board of Trade	John Cain, Augustine Dovis, Hon. Geo. W. Sterling.
Indianapolis, Ind	Board of Trade	George W. Sloan, A. J. Halford, James R. Carnehan.
Indianola, Tex	Board of Trade	H. J. Huck, Emile Reiffert.

List of boards of trade, chambers of commerce, and other organizations, &c.—Continued.

Place.	Name of organization.	Committee.
Jacksonville, Fla	Jacksonville Board of Trade.	Dr. A. S. Baldwin, Reed, Clark, Bower, Fuerlie.
La Crosse, Wis	Board of Trade	D. A. McDonald, John Rau, J. H. Sierman.
Leavenworth, Kans	Board of Trade	Dr. R. J. Brown, Judge L. Hawn, L. Mayo.
Los Angeles, Cal	Los Angeles Board of Trade.	Eugene Germain, Vinton L. Mitchell, W. A. Clinton.
Louisville, Ky	Board of Trade	William Cornwall, jr., J. B. Speed, Graham Wilder, J. A. Tanner, E. H. Bowen, Nick Finzer, R. M. Kelly.
Do	Polytechnic Society	E. A. Grant, M. D., LL. D.; Prof. J. A. Tanner, M. D.; Prof. H. W. Eaton, Ph. D.
Lynchburg, Va	Chamber of Commerce	R. H. T. Adams, Joseph Cohn, William Hunt.
Memphis, Tenn	Cotton Exchange	D. P. Hadden, John D. Milburn, J. J. Freeman, H. A. Hamilton, M. Gavin, James Yonge, L. A. Scarbrough, A. A. Paton, John Overlon, jr., B. J. Semmes.
Do	Merchants' Exchange	A. J. Livermore, J. F. Frank, A. D. Langstaff.
Milwaukee, Wis	Milwaukee Chamber of Commerce.	John L. Hathaway, John B. Merrill, David Vance.
Mobile, Ala	Mobile Cotton Exchange	W. H. Gardner, Adolph Proskaner, D. E. Huger.
Do	Mobile Chamber of Commerce.	Hon. Peter Hamilton, W. H. Gardner, E. O. Zadek.
Nashville, Tenn	Merchants' Exchange	J. W. Hopkins, E. D. Hicks, H. W. Grantland.
New Haven, Conn	Chamber of Commerce	Henry G. Lewis, Johnson T. Platt.
New London, Conn		James Fitch, George T. Marshall, H. S. Bartlett, E. A. Delaney, R. M. Waterman, Leonard Smith.
New Orleans, La	Cotton Exchange	Jas. A. Renshaw, chairman; J. L. McLean, R. S. Day, J. P. Dobbins.
Do	Produce Exchange	J. T. Brodnax, H. J. Roman, C. H. Allen.
Do	Sugar Exchange	J. Barkley, B. M. King, W. B. Bloomfield, P. Lanaux, W. Henderson.
New York City	Cotton Exchange	Walter T. Miller, Jas. F. Maury, Wm. P. Campbell.
Norfolk, Va	Norfolk and Portsmouth Cotton Exchange.	John N. Vaughan, Adam Tredwell.
Omaha, Nebr	Board of Trade	Thomas Gibson, Andrew Rosewater, Peter Windheim, F. C. Festner.
Oswego, N. Y	Board of Trade	J. L. McWhorter, A. S. Failing, W. R. Hosmer.
Pensacola, Fla	Board of Trade and Exchange.	Hon. S. C. Cobb, Hon I. M. Tarble, H. Baars.
Philadelphia, Pa	Philadelphia Maritime Exchange.	Charles Gibbons, jr.; Edmund D. Smith, George E. Bartol.
Pittsburg, Pa	Coal Exchange	Richard Barrows, M. E. Lynn, John W. Risher.
Portland, Me	Board of Trade	C. H. Farley, M. N. Rich, William Senter.
Portland, Oreg	Chamber of Commerce and Board of Trade.	Rev. Dr. Geo. H. Atkinson, E. H. Page, George H. Himes.
Rochester, N. Y	Merchants' Exchange	John Siddons, H. S. Hebard, George Schofield.
San Diego, Cal	Society of Natural History	Dr. G. W. Barnes, E. J. Buell, C. J. Fox.
Sandusky, Ohio	Board of Trade and City Council.	J. O. Moss, C. N. Ryan, R. B. Hubbard.
San Francisco, Cal	Chamber of Commerce	William L. Merry, Jacob S. Tabor, W. W. Dodge.
Savannah, Ga	Savannah Cotton Exchange.	C. M. Holst, A. L. Hartridge, J. J. Wilder.
Shreveport, La	Cotton Exchange	Col. R. H. Lindsay, Henry Florsheim, F. J. Alcocke.
Saint Louis, Mo	Merchants' Exchange	D. H. Bartlett, James L. Huse, John H. Carroll, Frank L. Johnston, Henry Laurey, C. S. Rogers.
Do	Cotton Exchange	I. T. Watson, sr.; C. W. Simmons, H. L. Rountree, J. H. Cogswell, C. S. Freeborn, Thomas S. Meir, W. E. Love.
Saint Paul, Minn	Saint Paul Chamber of Commerce.	R. O. Sweeney, Rev. David Breed, M. N. Kellog.
Toledo, Ohio	Toledo Produce Exchange	W. T. Walker, W. H. Bellman, John Cummings.
Vicksburg, Miss		Capt. E. C. Carroll, Thomas Mount, Dr. G. W. Howard, J. D. Tieney.
Wilmington, N. C	Chamber of Commerce	A. H. Van Bokkelen, Geo. Harriss, William L. De Rosset.
Yankton, Dak		J. C. McVay, chairman, president First National Bank; A. W. Barber, H. G. Clark.

APPENDIX 65.

REPORT OF THE FACT AND INTERNATIONAL BULLETIN DIVISION.

OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., July 1, 1885.

In this division are prepared the Monthly Weather Review, the Summary and Review of International Meteorology, and the International Bulletin.

In the Review are discussed the general weather conditions for each month and any abnormal features. The tabulated reports and charts of this publication are of the greatest importance to all interested in meteorology. With the Review for August was issued a new chart (No. IV), exhibiting the departures from the normal atmospheric pressure and temperature; this chart is now a permanent feature of the Review, and its issue has elicited favorable comment from meteorologists.

The Summary and Review of International Meteorology has been continued, and efforts are being made to bring up to date the series of international charts (No. III—storm tracks) accompanying this publication. The increased amount of data now received (principally marine observations) renders possible a more accurate tracing of the storm centers, and greatly increases the value of the charts.

The International Bulletin was issued during the year, but it has been decided to discontinue its publication after June 30, 1885; the issue of the daily international chart (No. I), however, will be continued, the map being on a much larger scale than heretofore. For the names of chiefs of meteorological services of the different countries who have rendered valuable services in the execution of this work, see Appendices, which also give a list of steamship lines co-operating, and complete information as to all sources from which data are received.

H. H. C. DUNWOODY,
First Lieutenant Fourth Artillery and Assistant.

APPENDIX 65 A.

List of military posts from which monthly meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1885.

Military posts.	State or Territory.	Military posts.	State or Territory.
Abraham Lincoln	Dakota.	Mojave	Arizona.
Alcatraz Island	California.	Monroe	Virginia.
Angel Island	Do.	Meade	Dakota.
Assinaboine	Montana.	Mount Vernon Barracks	Alabama.
Barrancas	Florida.	Mason	California.
Benicia Barracks	California.	Niagara	New York.
Brady	Michigan.	Pembina	Dakota.
Bidwell	California.	Plattsburg Barracks	New York.
Buford	Dakota.	Preble	Maine.
Bridger	Wyoming.	Presidio of San Francisco	California.
Brown	Texas.		
Columbus	New York.	Randall	Dakota.
Concho	Texas.	Reno	Indian Territory.
David's Island	New York.	Robinson	Nebraska.
Ellis	Montana.	Shaw	Montana.
Fred Steele	Wyoming.	Sisseton	Dakota.
Gaston	California.	Snelling	Minnesota.
Hamilton	New York.	Saint Francis Barracks	Florida.
Jefferson Barracks	Missouri.	Sully	Dakota.
Keogh	Montana.	Spokane	Washington.
Klamath	Oregon.	Totten	Dakota.
Lyon	Colorado.	Townsend	Washington.
Lewis	Do.	Union	New Mexico.
Madison	New York.	West Point	New York.
McDermit	Nevada.	Wingate	New Mexico.
McDowell	Arizona.	Yates	Dakota.
McHenry	Maryland.		

APPENDIX 65 B.

The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer during the year ending June 30, 1885.

[Their names are published in the Monthly Weather Review issued from this office.]

Post-office.	State or Territory.
Antrim	New Hampshire.
Ashwood	Tennessee.
Amherst (3)	Massachusetts.
Anna	Illiniois.
Accotink	Virginia.
Albany	Oregon.
Austin	Tennessee.
Albany	New York.
Archer	Florida.
Austin	Texas.
Andersonville	Georgia.
Allison	Kansas.
Aiken	South Carolina.
Auburn	New York.
Atchison	Kansas.
Ainsworth	Washington.
Athens	Georgia.
Ann Arbor	Michigan.
Albion	Idaho.
Altoona	Pennsylvania.
Ashville	North Carolina.
Ashland	New Hampshire.
Beloit	Wisconsin.
Blooming Grove	Pennsylvania.
Bunker Hill	Illinois.
Blue Hill	Massachusetts.
Bethel	Connecticut.
Brevard	North Carolina.
Blakeley	Washington.
Belvidere	New Jersey.
Burlington	Vermont.
Bandon	Oregon.
Blacksburg	Virginia.
Blue Lake	California.
Birmingham	Alabama.
Boyne	Michigan.
Bird's Nest	Virginia.
Bruington	Do.
Birmingham	Michigan.
Brattleborough	Vermont.
Buchanan	Michigan.
Braddock	Colorado.
Bristol	New Hampshire.
Belmont	Do.
Benaja	North Carolina.
Cumberland	Maryland.
Charlotte	Vermont.
Cambridge	Massachusetts.
Cornish	Maine.
Catawissa	Pennsylvania.
College Hill	Ohio.
Clay Centre	Kansas.
Cresco	Iowa.
Cooperstown	New York.
Carson City	Nevada.
Curryville	Missouri.
Cleveland	Ohio.
Cincinnati	Do.
Cedar Rapids (2)	Iowa.
Collinsville	Illinois.
Chambersburg	Pennsylvania.
Chapel Hill	North Carolina.
Caldwell	New Jersey.
Cleburne	Texas.
Contoocook	New Hampshire.
Conception	Missouri.
Crete	Nebraska.
Chester	Minnesota.
College City	California.
Currie	Minnesota.
Clinton	Indiana.
Clarksville	Texas.
Carthage	Missouri.
Comfort	Texas.
Charleston	Illinois.
Colorado Springs	Colorado.
Clyde	Ohio.
De Soto	Nebraska.
Dyberry	Pennsylvania.
Des Moines	Iowa.
Dudley	Massachusetts.
Dorset	Vermont.
Drifton	Pennsylvania.
Dillingersville	Do.
Dale Enterprise	Virginia.
Deerfield	Massachusetts.
Dover	New Jersey.
Embarras	Wisconsin.
Eola	Oregon.
Emporia	Kansas.
Emmittsburg	Maryland.
Edgington	Illinois.
Elk Falls	Kansas.
Easton (2)	Pennsylvania.
Ellensburg	Washington.
East Portland	Oregon.
Elk Park	North Carolina.
Fremont	Nebraska.
Fort Scott	Kansas.
Factoryville	New York.
Franklin	Pennsylvania.
Fort Wayne	Indiana.
Forsyth	Georgia.
Fall River	Massachusetts.
Frankfort	Kentucky.
Fallsington	Pennsylvania.
Fallston	Maryland.
Fort Madison	Iowa.
Fort Collins	Colorado.
Franklin	Wisconsin.
Fall Brook	California.
Fayetteville	Arkansas.
Flat Rock	North Carolina.
Fairbury	Nebraska.
Germantown	Pennsylvania.
Genoa	Nebraska.
Gardiner	Maine.
Guttenberg	Iowa.
Grampian Hills	Pennsylvania.
Grand Coteau	Louisiana.
Garretsville	Ohio.
Greensborough	Alabama.
Green Springs	Do.
Guilford	Indiana.
Gallinas Spring	New Mexico.
Grand Junction	Colorado.
Heath	Massachusetts.
Hillsdale	Michigan.
Helvetia	West Virginia.
Humboldt (2)	Iowa.
Haverford College	Pennsylvania.
Highlands	North Carolina.
Humphrey	New York.
Hulmeville	Pennsylvania.
Hudson	Michigan.
Hydesville	California.
Hastings	Minnesota.
Hiram	Ohio.
Hartford	Connecticut.
Holton	Kansas.
Harvard	Nebraska.
Harrisville	Michigan.

The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer, &c.—Continued.

Post-office.	State or Territory.
Huntsville	Texas.
Honey Grove	Do.
Indianola	Iowa.
Ithaca (2)	New York.
Independence	Iowa.
Independence	Kansas.
Ionia	Michigan.
Independence	Missouri.
Jacksonborough	Ohio.
Johnsontown	Virginia.
Jeffersonville	Indiana.
Jefferson	Ohio.
Kalamazoo	Michigan.
Klamath Agency	Oregon.
Kiantone	New York.
Kellys	North Carolina.
Lansing (2)	Michigan.
Logan	Iowa.
Lawrence	Kansas.
Lunenburg	Vermont.
Lenoir	North Carolina.
Laconia	Indiana.
Logansport	Do.
Lafayette	Do.
Leetsdale	Pennsylvania.
Limona	Florida.
Lancaster	Wisconsin.
Leavenworth	Kansas.
Liberty Hill	Louisiana.
Luling	Do.
Le Roy	New York.
Lexington	Michigan.
Lincolnton	North Carolina.
Leicester	Massachusetts.
La Grange	Indiana.
Lake Village	New Hampshire.
Los Angeles	California.
McDonogh	Maryland.
Marshall	Michigan.
Minneapolis	Minnesota.
Manitowoc	Wisconsin.
Mayport	Florida.
Marengo	Illinois.
Mendon	Massachusetts.
Mount Ida	Arkansas.
Manhattan (2)	Kansas.
Muscatine	Iowa.
Moorestown	New Jersey.
Mount Vernon	Iowa.
Morriston	Dakota.
Mattoon	Illinois.
Marion	Virginia.
Monticello	Iowa.
Mountainville	New York.
Mendon	Michigan.
Marquette	Nebraska.
Madison	Wisconsin.
Milan	Tennessee.
Mottville	Michigan.
Manchester	Iowa.
Manistique	Michigan.
Milledgeville	Georgia.
Maud	Kansas.
Maynard	Iowa.
Manatee	Florida.
Mauzy	Indiana.
Madison	Nebraska.
Moorestown	Michigan.
Mahanoy Plane	Pennsylvania.
Medora	Dakota.
Northfield	Minnesota.
Neillsville	Wisconsin.
Newport	Vermont.
Northport	Michigan.
North Lewisburg	Ohio.
New Ulm	Texas.
North Volney	New York.
New Bedford	Massachusetts.
Nephi	Utah.
Newport	Florida.
New Athens	Ohio.
Nayatt Point	Rhode Island
North Colebrook	Connecticut
Norfolk	Do.
Orono	Maine.
Oakland	California.
Oskaloosa	Iowa.
Ogretta	North Carolina.
Ottumwa	Iowa.
Oswego	Kansas.
Oroville	California.
Peoria	Illinois.
Port Jervis	New York.
Penn Yan	Do.
Phillipsburg	New Jersey.
Pierce City	Missouri.
Paterson	New Jersey.
Pro Tem	Missouri.
Poway	California.
Princeton	Do.
Portsmouth	Ohio.
Princeton	Massachusetts.
Peru	Nebraska.
Pueblo	Colorado.
Puerto de Luna	New Mexico.
Providence	Rhode Island.
Prairie du Chien	Wisconsin.
Palo Alto	Mississippi.
Princeton (2)	New Jersey.
Point Pleasant	Louisiana.
Pacolet	South Carolina.
Post Mills	Vermont.
Quakertown	Pennsylvania.
Quitman	Georgia.
Rowe	Massachusetts.
Rockford	Illinois.
Ripon	Wisconsin.
Readington	New Jersey.
Red Willow	Nebraska.
Richardton	Dakota.
Richmond	Kentucky.
Rising Sun	Indiana.
Raleigh	North Carolina.
Round Grove	Iowa.
Readville	Massachusetts.
Reed City	Michigan.
Somerset	Massachusetts.
South Orange	New Jersey.
Sandusky	Ohio.
Snowville	Virginia.
Southington	Connecticut.
Savannah	Ohio.
Salina	Kansas.
Swanwick	Illinois.
Strafford	Vermont.
Stateburg	South Carolina.
Salinas City	California.
Somerville	New Jersey.
State College	Pennsylvania.
Sacramento	California.
Stockham	Nebraska.
Swartz Creek	Michigan.
Sussex	Wisconsin.
Spiceland	Indiana.
Sunman	Do.
Springfield	Arkansas.
Sycamore	Illinois.
Sandwich	Do.
Statesville	North Carolina.
Syracuse	New York.
Salem	New Jersey.

The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer, &c.—Continued.

Post-office.	State or Territory.	Post-office.	State or Territory.
Sherlock	Kansas.	Williamstown	Massachusetts.
Springfield	Missouri.	Wabash	Indiana.
San Rafael	California.	Westborough	Massachusetts.
Sterling	Kansas.	Wytheville (2)	Virginia.
Summit	Virginia.	Washington (5)	District of Columbia.
South Bethlehem	Pennsylvania.	White Plains	New York.
Stowe	Vermont.	Wellsburg	West Virginia.
South Evanston	Illinois.	Westerville	Ohio.
Seward	Nebraska.	Wellington	Kansas.
		Woodstock	Vermont.
Traverse City	Michigan.	Wellsborough	Pennsylvania.
Thornville	Do.	Worcester	Massachusetts.
Topeka	Kansas.	Wauseon	Ohio.
Tallahassee	Florida.	Weir's Bridge	New Hampshire.
Taunton	Massachusetts.	Woodstock	Do.
Terre Haute	Indiana.	Wolfborough	Do.
Troy	Pennsylvania.	Wilkesbarre	Pennsylvania.
Tamaqua	Do.	Webster	Dakota.
Tucson	Arizona.	West Bend	Iowa.
Tecumseh	Nebraska.	Wausau	Wisconsin.
Tacoma	Washington.	Wyandotte	Kansas.
Tiffin	Ohio.	Westmoreland	Do.
Tower House	California.	Warrenton	Missouri.
		Wilton Centre	Illinois.
Variety Mills	Virginia.	West Union	Iowa.
Vevay	Indiana.	Waterville	Maine.
Vermillion	New York.	Washington	Pennsylvania.
Voluntown	Connecticut.	Wysox	Do.
Vermillion	Dakota.	Wentworth	Dakota.
Vineland	New Jersey.		
		Yates Centre	Kansas.
Woodstock	Maryland.	Yutan	Nebraska.
West Chester	Pennsylvania.	Yellow Springs	Ohio.
Weldon	North Carolina.		

FOREIGN COUNTRIES.

Post-office.	Country.	Post-office.	Country.
Coal Harbor	British Columbia.	Mazatlan	Mexico.
Grand Turk	British West Indies.	Paramaribo	Dutch Guiana.
Mount Forest	Canada.	York Factory	Canada.

APPENDIX 65 C.

List of State weather services from which meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1885.

Alabama State weather service, under direction of Prof. P. H. Mell, jr., Auburn, Ala.

Georgia State weather service, under direction of J. T. Henderson, commissioner of agriculture, Atlanta, Ga.

Illinois State weather service, under direction of C. F. Mills, secretary of the State board of agriculture, Springfield, Ill.

Indiana State weather service, under direction of Prof. H. A. Huston, Lafayette, Ind.

Indiana volunteer weather service, under direction of Prof. W. H. Ragan, Greencastle, Ind.

Iowa State weather service, under direction of Prof. Gustavus Hinrichs, Iowa City, Iowa.

Louisiana State weather service, under direction of Mr. Robert S. Day, New Orleans, La.

Michigan State weather service, under direction of Dr. H. B. Baker, Lansing, Mich.

Minnesota State weather service, under direction of Prof. W. W. Payne, Northfield, Minn.

Mississippi State weather service, under direction of Prof. R. B. Fulton, Oxford, Miss.

Missouri State weather service, under direction of Prof. F. E. Nipher, Saint Louis, Mo.

Nebraska State weather service, under direction of Prof. G. D. Swezey, Crete, Nebr.

New England Meteorological Society, under direction of Prof. W. Upton, Providence, R. I.

New Jersey State weather service, under direction of Mr. W. E. Cass, Newark, N. J.

Ohio State weather service, under direction of Prof. T. C. Mendenhall, Columbus, Ohio.

Tennessee State weather service, underd irection of A. J. McWhirter, commissioner of agriculture, Nashville, Tenn.

APPENDIX 65 D.

List of foreign meterological bureaus, vessels, and stations from which international simultaneous observations have been received.

Algeria and Tunis, by M. Thivenet, director of the Meteorological College of Science of Algeria.

Australia, by R. L. J. Ellery, director of the observatory at Melbourne, New South Wales.

Austria-Hungary, by Prof. Dr. Julius Hann, director of the Imperial and Royal Central Meteorological Institute at Vienna.

Belgium, by J. C. Houzeau, director of the Royal Observatory at Brussels.

Brazil, by Prof. E. Cruls, director of the Imperial Observatory at Rio de Janeiro.

Great Britain, by the Meteorological Council, London, Robert H. Scott, F. R. S., secretary.

Canada, by Charles Carpmael, A. M., F. R. A. S., director of the Magnetic Observatory at Toronto, and superintendent of the Meteorological Office of the Dominion of Canada.

Cape Colony, by the Meteorological Commission of Cape Colony at Cape Town.

Chili, by authority of the secretary of public instruction, through Francisco Vidal Gormaz, president of the Central Meteorological Office at Santiago.

China, by W. Dorberck, Government astronomer, director of the observatory at Hong Kong, and by Marc. Dechevrens, S. J., director of the Meteorological Observatory at Zi-Ka-Wei.

Denmark, by Adam Paulsen, director of the Royal Danish Meteorological Institute at Copenhagen.

Egypt, by Albert Ismalun, director of the Laboratoire Khédivial du Caire.

France, by Prof. E. Mascart, director of the Central Meteorological Bureau of France.

Germany, by Prof. Dr. G. Neumayer, director of the German Marine Observatory at Hamburg.

Greece, by D. K. Kokkides, director of the Royal Observatory at Athens.

India, by H. F. Blanford, meteorological reporter to the Government of India.

Italy, by his excellency the minister of agriculture, industry, and commerce, through Prof. P. Tacchini, director of the Central Meteorological Office at Rome.

Japan, by the geographical bureau, department of the interior, through I. Arai, director of the Imperial Meteorological Observatory at Tokei.

Mauritius, by C. Meldrum, secretary of the Meteorological Society of Mauritius.

Mexico, by authority of the secretary of public works, through Senor Mariano Bárcena, director of the Central Meteorological Observatory at Mexico.

Netherlands, by Prof. Buys Ballot, director of the Royal Meteorological Institute at Utrecht.

Norway, by Prof. H. Mohn, director of the Royal Norwegian Meteorological Institute at Christiania.

Portugal, by J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon.

Russia, by Prof. H. Wild, director of the Imperial Central Physical Observatory of Russia at St. Petersburg.

Spain, by the directory of the Royal Observatory at Madrid.

Sweden, by Prof. R. Rubenson, director of the Royal Swedish Meteorological Institute at Stockholm, and by Prof. H. H. Hildebrandsson, director of the Meteorological Observatory at Upsala.

Switzerland, by Prof. E. Gautier, director of the observatory at Geneva.

Turkey, by A. Coumbary, effendi, director of the Central Observatory at Constantinople, and by Robert H. West, B. A., director of the Lee Observatory at Beirut.

United States of Colombia, by Ensign R. K. Wright, United States Navy, in behalf of the General Interoceanic Canal Company, and the respective observers of all sub-series.

British Naval, by the Meteorological Council of London, through Robert H. Scott, F. R. S., secretary.

Portuguese Naval, by J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon.

United States Navy, by the honorable the Secretary of the Navy, through Commodore John G. Walker, U. S. N., Chief of the Bureau of Navigation.

Series.	Stations reporting.	Series.	Stations reporting.
Algerian	9	Mexican	2
Australian	3	Netherlands	6
Austro-Hungarian	12	Norwegian	4
Belgian	4	Portuguese	9
Brazilian	1	Russian	40
British	27	Spanish	10
Canada	39	Swedish	6
Cape Colony	3	Swiss	1
Chilian	7	Turkish	4
Chinese	2	United States of Colombia	2
Danish	9	United States sub-series	6
Egyptian	1		
French	43	Total number of foreign stations reporting daily	333
German	18	United States series	135
Greek	1		
Indian	23		
Italian	17	Total number of stations reporting daily to June 30, 1885 (land)	468
Japanese	23		
Mauritius	1		

SUMMARY.

Number of vessels reporting in the—	
British navy	43
Portuguese navy	1
United States Navy	39
Marine reports furnished by the New York Herald weather service; vessels	63
Steamships, sailing vessels, &c., reporting direct to this office	419
Total naval and marine reports to June 30, 1885	565
Total land stations reports to June 30, 1885	468
Total number of international reports to June 30, 1885	1033

APPENDIX 66.

REPORT OF ASSISTANT IN CHARGE OF STUDY DIVISION.

STUDY DIVISION, *August* 24, 1885.

SIR: I have the honor to submit the accompanying as my annual report of work done in the Study Division. The appendices A to H will be shortly submitted in duplicate.

Very respectfully submitted.

CLEVELAND ABBE,
Professor and Assistant.

The CHIEF SIGNAL OFFICER.

APPENDIX 66 A.

Annual report of Study Division, June 30, 1885.

PERSONAL.

During the past fiscal year the changes in this division have been as follows:

Professor Marvin was assigned to duty September 1, 1884, and was transferred to the Physical Laboratory in January, 1885; Sergeant Marbury was transferred to Marine Agency December 11, 1884; Corporal Daniels was transferred to Marine Agency December 3, 1884; Private Dilley was assigned to duty, December 3, 1884.

CONSULTING SPECIALISTS.

As occasion has required, special questions have been referred to eminent scientists who have kindly acted gratuitously as consulting specialists.

TABLES.

The tables referred to this division for preparation and revision have been the following:

(1) Tables and instructions for the application of the gravity correction, prepared for use on and after January 1.

(2) The revision of tables for the computation of dew-point and humidity: these are now being prepared conjointly with Professors Ferrel and Marvin. An independent investigation of one portion of this subject has been prosecuted by Professor Hazen in connection with the exposure of thermometers.

(3) The annual revision of the table of monthly constants for reduction of the barometer to sea level at Signal Service stations has been made and promulgated as General Orders No. 6, 1885. A corrected copy of this table, together with all changes made up to June 30, is submitted herewith. Improved methods for this reduction have also been prepared and recommended by me for adoption in place of the monthly constants now in use, as the latter often give very objectionable distortions of the isobars. Numerous smaller tables have been prepared for use in the Fact and International Bulletin Division.

INSTRUMENTAL STANDARDS.

The general question of the construction and preservation of the instrumental standards of this office was by Instructions No. 6, 1885, transferred to the Physical Laboratory Division. I have, therefore, referred to that division with appropriate recommendations, such unfinished work and new questions as refer to this subject.

STANDARD EXPOSURES AND ERRORS DUE TO EXPOSURE AND ESTABLISHMENT OF INSTRUMENTS.

(*a*) *Barometer.*—No changes in the method of mounting the barometer has taken place since the introduction of the barometer box. In order to ascertain the possible influence of wind, and especially the correction for the effect of suction up a chimney upon the pressure within a room in direct connection therewith, I have devised the form of mounting mentioned in my previous reports, and recommend that a trial of it be made.

The errors incurred in changing the locations of barometers at stations have been investigated, and a report submitted from which it is seen that sometimes comparisons are not at present made with sufficient accuracy to determine instrumental changes less than 0.01 or even 0.02 inch.

(*b*) *Thermometers.*—The question of the proper exposure of thermometers has continued a matter of careful study in this division. Extensive experiments have been carried on both in this city and at Fort Myer and in other places. A report on the work accomplished, embodying the results of all the experiments, has been prepared by Professor Hazen and published as Professional Paper No. XVIII (now in press). As a practical application of the results of these investigations an improved shelter has been adopted, by the recommendation of a special board of officers, especially on that of Professor Hazen, and has already been supplied to many Signal Service stations. Continuous attention is also devoted to the locations and environments of thermometers and shelters and many improvements have been made.

The special board just alluded to has decided to adopt some form of whirling thermometer simultaneously with the adoption of Ferrel's improved psychrometric tables.

(*c*) *Anemometers.*—These have always been established at Signal Service stations as high as practicable above the roof or ground. Observations have shown that the velocity of the wind increases quite rapidly up to an altitude of about 100 feet, and after that more slowly. No uniform altitude for location of anemometers has been adopted nor is practicable, but a method of reducing all records to a standard altitude is desirable.

The comparison of anemometers on station with the standard at Washington by means of substandards that are carried by inspecting officers has never yet been attempted by this service, but evidently should not longer be neglected. A first series of this kind has been made and demonstrates the practicability and importance of such work.

From measurements made as to dimensions of station anemometers, I find that our recorded velocities are in excess by about 20 per cent. of their true value as computed by Dohrandt's formula; in other words our records should be multiplied by the factor .85 to obtain the correct velocities. The application of this correction will, it seems to me, be an important improvement in our work and a proposition to the next International Congress looking to the general adoption of a similar instrumental correction is recommended by me. The exact determination of the above factor for each anemometer by the use of the whirling table should be made the duty of the Physical Laboratory as soon as it is practicable to establish the apparatus.

As requests are frequently made for data as to the force of the gusts in our heaviest hurricanes and tornadoes, to the observation of which the Robinson anemometer is not adapted, I have for several years desired to construct and experiment with several special forms of anemometers, hoping thereby to obtain the data desired by builders and engineers. Apparatus for this purpose has been designed and its construction is recommended by me.

(*d*) *Rain-gauge.*—The effect of variations in the exposure of rain-gauges has been studied by special observations at Mount Washington and by duplicate records made at about sixty other stations. On account of the large variation due to roof exposure in the collection of rain and snow, it may become necessary to establish standard rain-gauges in open fields outside the cities occupied by Signal Service stations. Our rainfall as at present recorded varies from what appears to be the true amount by percentages, ranging from 40 per cent. deficiency to a slight excess. The remedies for this are (1) improved exposures, or (2) the correction of present records. As to the first, efforts are being made wherever possible to improve the exposure; as to the second, a correction to annual averages may perhaps be obtained, but not one for monthly or individual record.

DROSOMETER.

In answer to several requests for apparatus for measuring dew, I have sketched out a simple form which has met with the approval of Professor Mendenhall, and with which he has promised to make comparative observations with a standard before issuing to stations.

EVAPORIMETER.

The question of evaporation from water and snow, and especially from vegetation, has continued to be entirely omitted from the schedule of Signal Service observations. This neglect of a matter in many respects so important is partly explicable by the difficult and unsatisfactory nature of the methods of observing, and partly by our indulging the hope that on account of its bearing on agriculture the matter would be more fully taken up by the agricultural colleges and State weather services. To a certain extent the difference between the wet bulb and dew point on the one hand and the wet bulb and dry bulb on the other gives us the means of determining the general character of the prevailing evaporation. Many important meteorological problems can however be answered only by knowing definitely the amount of evaporation from each portion of the earth's surface. I therefore consider it urgently desirable to inaugurate observations on this subject at a number of selected stations.

SKY COLORS.

The accurate observation of the colors of the sky promises to give important information with regard to the vapor and dust suspended therein. These observations should cover not only the blue tints recorded by the use of Arago's cyanometer, but also the red, purple, and green that are frequently observed. Probably some modification of Maxwell's color box will be found the most convenient apparatus, and several capable men should be set to work on this problem. It will be remembered that the red skies of 1883 found us wholly unprepared for this kind of observation, a misfortune that should not be allowed to happen again.

SPECTROSCOPE AND POLARISCOPE.

Each of these instruments offers in its own way information relative to the moisture in the atmosphere not obtainable from other sources. Through the kind co-operation proffered by Professor Cook, of Dartmouth College, and Professor Pickering, of Harvard University, it is hoped that valuable results may be obtained from observations with the modified forms of these instruments that have been devised.

TIME.

I attended as a delegate the International Prime Meridian and Time Conference, held in this city in October, 1884. The standard clock is in the hands of the makers for necessary alterations. The fire-proof room for the preservation of a constant temperature around the clock has been transferred to the Stations Division for the storage and preservation of records. On January 1, 1885, the clocks at all Signal Service stations were set to the time of the seventy-fifth meridian. To facilitate this change, a table showing for all stations the difference between true local time and seventy-fifth meridian time was prepared.

ATMOSPHERIC ELECTRICITY.

At a national congress of electricians held in September, 1884, in Philadelphia, I presented by your instructions a statement of Signal Service work in atmospheric electricity and received assurance of hearty co-operation. An advisory committee was appointed to report upon an international system of observations and records. The observations of ground currents at Ooglaamie, Alaska, have been reduced by Professor Trowbridge and Sergeant McRae for publication in Lieutenant Ray's report of his work at that station. Since December, 1884, the subject of atmospheric electricity has been transferred to the hands of Professor Mendenhall, in charge of the physical laboratory.

SOLAR RADIATION.

A standard pair of conjugate thermometers was ordered during the previous fiscal year, and although not yet received, it was decided to issue early in the present year the apparatus already on hand to twenty selected stations without waiting for the desired comparative readings, and with such instructions as might be agreed upon and recommended by Professor Ferrel and myself. The effect of the great variety of exposures that must inevitably occur at Signal Service stations was by me considered to be likely sensibly to invalidate the results, and I felt it necessary to ascertain experimentally what method would be practicable for overcoming this difficulty. Unfortunately, the record of observations bearing on this matter was lost in the confusion incident to the fire in February, 1885. As soon as this work can be repeated and a uniform method of exposure can be decided on, or, still better, a method of correction for the peculiarities of any exposure, it will be practicable to issue the conjugate thermometers to selected stations. Meanwhile the importance of other forms of apparatus, especially the methods of chemical reactions, has been strongly urged by agriculturists because of their more direct application to the growth of plants.

The duration and intensity of sunshine constitutes an independent phenomenon having some points in common with the preceding and a simple form of sunshine recorder less expensive and more certain than the Campbell recorder is very desirable.

MOUNT WHITNEY RESERVATION.

Proposals have been received from responsible parties in California offering to secure the equipment of a full station on the Mount Whitney Reservation. It is very desirable that this should be accomplished soon.

THUNDERSTORM SUB-DIVISION.

The special observation and study of thunderstorms begun last year by Professor Hazen, with the kind co-operation of the Post-Office Department, has been carried on in the thunderstorm subdivision with valuable results. About 15,000 reports on postal cards from 2,500 observers have been received. Monthly summaries of thunderstorms are compiled for insertion in the Monthly Weather Review, and a report on the thunderstorms of May, 1884, has been published as Signal Service Note No. 20. A partial study of the storms of the year 1884 was completed in April, and, with your permission, was presented before the Philosophical Society of Washington as a summary of the results thus far obtained from this work. This paper is in course of preparation for publication.

TORNADO SUBDIVISION.

The methods of investigation in use during the preceding year have been employed this year with but few changes or additions.

A large part of the work of this subdivision consists in the collection of data relative to tornadoes and other violent local storms.

During the past year 461 additional tornado reporters have been secured, thus making the total number of tornado stations 1,307. These reporters are supplied with the necessary blanks, circulars, and envelopes to enable them to render reports to this office without expense to themselves for these materials.

In the prosecution of the work 4,744 communications have been sent out during the year and 2,770 letters received, together with 1,023 regular reports filled out on forms furnished for the report of tornadoes and destructive storms. Additional data has also been obtained from newspaper clippings either furnished by tornado reporters or obtained from the regular file of papers at this office; several hundred such clippings have been filed in tornado scrap-books during the year.

Some attention has been given to the collection of views and photographs pertaining to tornadoes; 519 have been obtained and placed in tornado albums. Seven hundred and twelve tornado reporters have been supplied with State maps for the purpose of charting thereon tornado tracks to be used in the more complete description of such storms.

For purposes of special study there have been prepared 105 charts showing the temperature and direction of the wind at numerous stations on the days on which tornadoes occurred, and as near the time of occurrence of the tornado as it was possible to obtain the observations. These charts are for the years 1882, 1883, and 1884.

Preliminary tornado charts, showing the relation of tornado centers to areas of barometric minima (4 charts in each set) were prepared for the tornadoes which occurred on July 4 and 5, August 2 and 28, September 9 and 28, 1884; January 11, March 11, 12, 27, and 28, April 1, 19, 21, 22, and 29, 1885; the total number of charts prepared being 64.

Daily tornado predictions were made by Lieutenant Finley in 1884 from March 10 to August 1, and were resumed in 1885 on June 1. The verification of these special predictions and the calculation of the proper percentage of verification has been carefully considered.

Professional Paper No. XVI, "Tornado studies for 1884," has been prepared by this subdivision; this contains among other things a chronological list of the 180 tornadoes which occurred during the year, with numerous charts showing the geographical distribution of tornadoes and their relation to barometric minima. Tornado circular No. 21 has also been prepared and issued to reporters; this contains instructions regarding the making of comparative observations. Ten monthly abstracts of tornado reports have been prepared for the officer in charge of the Fact and International Bulletin Division to be used in the preparation of the Monthly Weather Review.

During the year all back reports have been examined, the data abstracted and entered in the tornado record books, and in local storm record books. In addition to these a number of papers, journals and other records on file in the Congressional Library have been examined and storm notes collected therefrom. The manuscript meteorological records at the Smithsonian Institution have been arranged by Professor Baird preparatory to an examination of them. A card index of all the tornadoes entered in the tornado record books has been compiled. A list of names and addresses of all tornado reporters is furnished herewith.

BIBLIOGRAPHY OF METEOROLOGY.

The compilation and editing of a complete index to the literature of meteorology was assigned to Mr. C. J. Sawyer on March 3, 1884, under my general supervision.

The material then on hand consisted of about 20,000 titles contributed by Prof. G. J. Symons, of London, and about the same number copied by myself from the Catalogue of scientific papers, published by the Royal Society.

The general plan of further work on this subject was approved by you as follows: "All additions consistent with an early publication to be secured; scope to be closely restricted to that of the Symons catalogue; bibliography to end with the year 1881; form to be that of a classed subject catalogue with full author index." This outlined plan has been strictly followed, except in so far as the want of an appropriation for printing has postponed the publication of the work, and will consequently permit a more extended collection of material.

On June 30, 1884, the number of accepted titles was about 26,853, after rejecting a large number of duplicates, and all of those relating to meteors, earthquakes, molecular physics, and other extraneous subjects, but retaining terrestrial magnetism. The work of the present year has been directed mainly to the correction and completion of defective titles and the collection of new ones.

For the latter purpose special attention has been paid to the serial literature previous to 1800, and subsequent to 1863. To do this it has been necessary personally to examine the libraries at Washington, Baltimore, and Philadelphia; the libraries of other cities will probably need to be examined in like manner. A summarized list of additions to the bibliography is given in Appendix C, which shows 20,338 new titles added during the year.

Besides the above new titles, there are on hand about 7,414 cards not yet examined for duplicates, the net addition from which will probably not be large.

The correspondence of the year has resulted in many very valuable contributions from scientists and librarians in this country and abroad.

To insure accuracy in the case of living writers, efforts have been made to obtain from authors personal lists of their publications; lithograph letters requesting such lists have been sent to 325 meteorological writers; including all countries except the German Empire, where Dr. Hellmann's employment of the same method rendered this unnecessary. Replies to 147 of these letters have been received, contributing manuscript lists of 7,495 titles.

In addition to those who have co-operated with us by furnishing lists of their own publications, many meteorologists and librarians have contributed special bibliographies for their respective countries, extracts from manuscript library catalogues, and other valuable bibliographical lists. A list of the more important of these contributions is given herewith.

When finished, the bibliography will fill two volumes of 900 octavo pages each. In order to have Volume I ready for the printer early in the fiscal year 1886–'87, the distinctive work of collection must soon cease and the entire force be employed on editorial work, consisting of classification by subjects, preparation of author index and periodical list, determination of details of publication, final revision of titles, and technical preparation for the printer.

The most difficult part of the work is the formation of a subject classification and the classification of titles under this, a work rendered especially difficult by the fact that many of the works and papers are not available for reference, often necessitating the determination of subjects from brief and ambiguous titles.

Dr. A. Lancaster, librarian of the Royal Observatory of Brussels, and joint author with Dr. Houzeau of "Catalogue des ouvrages d'astronomie et de météorologie. Bruxelles, 1878," and the admirable "Bibliographie générale de l'astronomie. Tome II. Bruxelles, 1882," has kindly granted his assistance in the formation of a subject classification, and has submitted a draft of one, which, with modifications, will answer excellently for the purpose.

The preparation of an author index will be carried on in connection with classification, and in such a way that, in case no appropriation for publishing be secured at the next session of Congress, the bibliography and index will be in the best possible form for use as a card catalogue.

LOCATIONS OF STATIONS.

The determination of the latitude and longitude and elevation of stations has continued in the hands of Professor Hazen, and revised values of these quantities have been furnished the Stations Division from time to time. The accompanying table (Appendix D) gives the elevation of all the barometers of the service on January 1, 1884, and all changes from that date up to June 30, 1885.

An attempt has been made to utilize the results of the precise line of levels now being prosecuted by the Coast and Geodetic Survey, and the elevations thus determined are properly designated in the accompanying table.

It is evident that the uncertainty of altitudes based on railroad levels may lead to appreciable errors in our barometric work, and it is very desirable that the accurate work of the Coast Survey should be extended to all our interior stations, if possible. To this end the correspondence had with the Coast Survey in 1881 has been revived, and it is hoped that it will be practicable to carry out the plan of work then mutually agreed upon.

BALLOON VOYAGES.

By an arrangement with Prof. S. A. King, æronaut, of Philadelphia, four balloon voyages have been made, with the special object of studying the distribution of temperature and moisture. The results are of the highest accuracy, and show the desirability of similar regular work in this field. The service is indebted to Professor King, who has done this work without other remuneration than the repayment of actual expenses. A full report of the results attained by the observer, Private Hammon, will be submitted for publication.

BOLOMETER STUDIES.

During the past two years our colaborer, Prof. S. P. Langley, has experimented upon a large scale with the bolometer as a means of detecting the amount of moisture in the free open air. He states that his observations with this instrument give important data bearing upon the distribution of heat in both the earth and the atmosphere. It is to be hoped that by repeating his observations in some other climate and locality, such as that of Washington, a complete check upon his results may be obtained, and to this end I recommend that he be invited to bring his apparatus to this city, where the grounds at Fort Myer afford an excellent location.

EARTHQUAKE OBSERVATIONS.

In October, 1884, I attended a conference called by the Director of the Geological Survey to discuss methods and plans for observations of earthquakes.

On the part of this office I assured the conference that you would maintain observations and seismographic records at Signal Service stations whenever the committee should agree upon satisfactory apparatus.

INSTRUCTION IN METEOROLOGY.

The course of instruction for lieutenants at this office, having special regard to work in the Indications Division, began June 1, 1885, since which time daily lectures of two hours each have been given by Professor Mendenhall and myself.

Lectures on meteorological subjects have been delivered by myself in the Washington Young Men's Christian Association lecture course and by Professor Hazen and Sergeant Curtis at the Washington high school.

The preparation of an elementary text-book on meteorology, designed to be introductory to the higher treatise on meteorology by Professor Ferrel, has been undertaken by Mr. W. M. Davis, of Cambridge, Mass.; it will probably meet the wants of this service, and be proper to put into the hands of every officer and enlisted man. A professional paper on the theory of instruments used in meteorology has been in course of preparation by me the past year. Its contents will be orally given to the class now under instruction, whose course began on June 1.

PUBLICATIONS.

Besides a number of minor articles, the following published papers have been prepared by members of the Study Division:

Abbe, Cleveland—Progress in Meteorology in 1884, 176 pp. 8vo, 1885.
Testimony before the Joint Committee of Congress.
"The earthquake of August 10." New York Herald, August 12, 1884.
Appalachian earthquakes. New York Herald, August 15, 1884.
Fassig, O. L.—Bibliography of Meteorology for 1884.
Finley, Jno. (Lieut.)—Signal Service Professional Paper, No. 14.
Signal Service Professional Paper, No. 16.
Signal Service Tornado Circular, No. 21.
Hazen, H. A.—"Tornado Generation." Amer. Meteor. Journal, September, 1884.
Tornadoes. Amer. Journal of Science, vol. xxviii, September, 1884.
Thunder-storms and their relation to "Low." Proc. A. A. A. S., vol. xxxiii. Philadelphia meeting, September, 1884.
Determination of air temperature and humidity. Amer. Meteor. Journal, vol. i, Nos. 9 and 10, January, February, 1885; translation in the Zeitschrift für Meteorologie, vol. xx, March, 1885.
Thunder-storms of May, 1884. Signal Service Notes, No. 20.
Curtis, G. E.—Reviews of Quarterly Journal of Meteorology and Symons' Meteorological Magazine in American Journal of Meteorology.

TRANSLATIONS.

The following articles have been translated in order to make them available for general use in the office:

"Ueber die Bestimmung der Temperatur und Feuchtigkeit der Luft." H. Wild. Zeitschrift für Meteorologie, October, 1884.

"Sui grandi movimenti della atmosfera e sulla previsioni del tempo. Prof. D. Ragona, Modena, 1881." Gratuitously translated by Rev. J. Hagen.

"Evaporation": de Saussure, in his Voyage dans les Alps. Tome vii; chap. viii.

[Climates of the globe]—Woeikof; first three chapters.

[The Glacial Epoch]—Woeikof.

[Glaciers and climate]—Woeikof.

"Le Siroco en Amérique et en Asie." F. F. Hébert. Annuaire de la Société mét. de France, pp. 85–89, vol. xxix, 1881.

APPENDIX 66 B.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, January 31, 1885.

GENERAL ORDERS No. 6.

The following table of monthly constants for the reduction of barometric observations to sea-level and standard gravity is published for the information of all concerned, and will go into daily use on March 1, 1885, replacing General Orders No. 5, from this office, series of 1884. On and after the above-mentioned date the columns of Form 113*a* headed "reduced to sea-level" will be amended to read "reduced to sea-level and standard gravity." The monthly mean pressures reduced to sea-level and standard gravity by this table for the months of January and February, 1885, will be inserted in red ink at the bottom of page 2 of Form 113*a*.

By order of the Chief Signal Officer.

B. M. PURSSELL,
Second Lieutenant, Signal Corps, U. S. Army.

Monthly constants (in inches) for the combined reduction of barometric observations made at Signal Service stations to sea-level and standard gravity.

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y	−0.006	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09
Alexander, Fort, Alaska	+0.036	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Alpena, Mich	0.000	0.71	0.71	0.70	0.69	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.71
Apache, Fort, Ariz	−0.025	5.09	5.07	5.00	4.90	4.80	4.75	4.72	4.70	4.77	4.88	5.08	5.06
Assinaboine, Fort, Mont	+0.009	3.06	3.06	3.03	2.92	2.86	2.81	2.75	2.77	2.87	2.94	3.00	3.05
Atlanta, Ga	−0.029	1.20	1.19	1.18	1.16	1.14	1.13	1.12	1.13	1.14	1.16	1.19	1.20
Atlantic City, N. J	−0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Augusta, Ga	−0.031	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16
Baltimore. Md	−0.015	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Barnegat City, N. J	−0.014	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Behring's Island, Behring Sea	+0.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Bennett, Fort, Dak	−0.001	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.54	1.59	1.62	1.69	1.76
Benton, Fort, Mont	+0.006	2.98	3.00	2.98	2.86	2.79	2.77	2.71	2.79	2.84	2.91	2.96	3.00
Bismarck, Dak	+0.005	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.88	1.93	2.02
Block Island, R. I	−0.010	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Boisé City, Idaho	−0.004	2.93	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.98
Boston, Mass	−0.007	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.13	0.13	0.13	0.14
Brownsville, Tex	−0.048	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Buffalo, N. Y	−0.005	0.78	0.79	0.78	0.76	0.73	0.72	0.71	0.71	0.72	0.74	0.77	0.78
Buford, Fort, Dak	+0.008	2.24	2.22	2.17	2.11	2.01	2.00	1.97	1.99	2.03	2.11	2.17	2.28
Cairo, Ill	−0.021	0.38	0.38	0.37	0.36	0.35	0.35	0.35	0.35	0.35	0.36	0.37	0.38
Canby, Fort, Wash	+0.004	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Cape Henry, Va	−0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cape May, N. J	−0.016	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cape Mendocino, Cal	−0.012	0.68	0.68	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.68	0.68	0.68
Cedar Keys, Fla	−0.041	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
Charleston, S. C	−0.032	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charlotte, N. C	−0.025	0.86	0.86	0.85	0.83	0.81	0.80	0.80	0.80	0.81	0.83	0.85	0.86
Chattanooga, Tenn	−0.026	0.83	0.83	0.82	0.81	0.79	0.78	0.77	0.78	0.79	0.80	0.82	0.84
Cheyenne, Wyo	−0.009	6.26	6.26	6.19	6.01	5.88	5.75	5.70	5.71	5.87	6.03	6.22	6.29
Chicago, Ill	−0.008	0.74	0.74	0.73	0.72	0.69	0.69	0.68	0.68	0.69	0.71	0.73	0.75
Chincoteague, Va	−0.019	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
Cincinnati, Ohio	−0.016	0.67	0.67	0.66	0.64	0.62	0.62	0.61	0.61	0.62	0.63	0.66	0.67
Cleveland, Ohio	−0.010	0.77	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.78
Columbus, Ohio	−0.013	0.90	0.90	0.89	0.87	0.84	0.83	0.82	0.82	0.83	0.86	0.89	0.91
Concho, Fort, Tex	−0.033	1.99	1.99	1.94	1.91	1.87	1.84	1.85	1.83	1.87	1.92	1.98	1.99
Custer, Fort, Mont	+0.002	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa	−0.010	0.70	0.69	0.68	0.66	0.64	0.63	0.62	0.62	0.64	0.65	0.68	0.70
Davis, Fort, Tex	−0.031	4.94	4.92	4.84	4.75	4.68	4.57	4.60	4.61	4.66	4.81	4.86	4.90
Dayton, Wash	+0.004	1.81	1.82	1.82	1.76	1.76	1.75	1.72	1.72	1.75	1.79	1.79	1.84
Deadwood, Dak	−0.002	4.95	4.92	4.84	4.69	4.52	4.44	4.43	4.44	4.56	4.68	4.84	4.99
Delaware Breakwater, Del	−0.017	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Denver, Colo	−0.012	5.51	5.51	5.43	5.26	5.15	5.03	5.00	5.01	5.10	5.25	5.49	5.51
Des Moines, Iowa	−0.009	0.96	0.95	0.94	0.91	0.88	0.87	0.86	0.86	0.88	0.90	0.92	0.94
Detroit, Mich	−0.007	0.75	0.75	0.74	0.72	0.69	0.69	0.68	0.68	0.69	0.71	0.74	0.75
Dodge City, Kans	−0.018	2.71	2.70	2.69	2.60	2.51	2.47	2.46	2.44	2.51	2.59	2.70	2.76
Dubuque, Iowa	−0.006	0.75	0.74	0.73	0.71	0.69	0.67	0.66	0.67	0.69	0.70	0.72	0.75
Duluth, Minn	+0.005	0.80	0.80	0.78	0.76	0.74	0.72	0.71	0.71	0.73	0.75	0.78	0.80
Eastport, Me	0.000	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Elliott, Fort, Tex	−0.024	2.91	2.88	2.81	2.76	2.68	2.65	2.62	2.62	2.67	2.77	2.91	2.94
El Paso, Tex	−0.030	3.85	3.85	3.77	3.71	3.61	3.56	3.57	3.57	3.62	3.71	3.82	3.83
Erie, Pa	−0.008	0.76	0.76	0.76	0.74	0.71	0.71	0.70	0.70	0.71	0.73	0.75	0.77
Escanaba, Mich	+0.002	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.68	0.70	0.72
Fort Smith, Ark	−0.026	0.50	0.50	0.49	0.47	0.46	0.46	0.45	0.45	0.46	0.47	0.49	0.50
Galveston, Tex	−0.040	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grand Haven, Mich	−0.005	0.70	0.70	0.70	0.68	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.70
Grant, Fort, Ariz	−0.028	4.87	4.83	4.80	4.70	4.58	4.51	4.54	4.54	4.57	4.67	4.81	4.85
Greencastle, Ind	−0.014	0.99	0.98	0.97	0.94	0.92	0.91	0.90	0.90	0.92	0.94	0.96	0.99
Hatteras, N. C	−0.026	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
Helena, Mont	+0.003	4.38	4.35	4.32	4.21	4.12	4.07	4.01	4.04	4.12	4.25	4.33	4.33
Huron, Dak	−0.002	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind	−0.014	0.84	0.84	0.83	0.81	0.78	0.78	0.77	0.77	0.78	0.80	0.83	0.85
Indianola, Tex	−0.012	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
Jacksonville, Fla	−0.038	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Keokuk, Iowa	−0.012	0.69	0.69	0.68	0.66	0.64	0.63	0.62	0.62	0.64	0.65	0.68	0.70
Key West, Fla	−0.051	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03
Kitty Hawk, N. C	−0.024	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
Knoxville, Tenn	−0.023	1.05	1.05	1.04	1.02	0.99	0.99	0.98	0.98	0.99	1.01	1.04	1.06
La Crosse, Wis	−0.003	0.82	0.81	0.80	0.78	0.76	0.74	0.73	0.74	0.75	0.77	0.80	0.82
Leavenworth, Kans	−0.015	0.91	0.94	0.92	0.89	0.86	0.85	0.84	0.85	0.86	0.89	0.92	0.95
Lewiston, Idaho	+0.004	0.83	0.83	0.82	0.80	0.79	0.78	0.77	0.77	0.78	0.80	0.83	0.84
Little Rock, Ark	−0.028	0.29	0.29	0.29	0.28	0.27	0.27	0.27	0.27	0.27	0.28	0.29	0.29
Los Angeles, Cal	−0.029	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36
Louisville, Ky	−0.018	0.59	0.59	0.58	0.58	0.56	0.56	0.55	0.55	0.56	0.57	0.58	0.59
Lynchburg, Va	−0.020	0.70	0.70	0.70	0.68	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71

Monthly constants (in inches) for the combined reduction of barometric observations made at Signal Service stations to sea-level and standard gravity—Continued.

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mackinaw City, Mich.	+0.002	0.71	0.70	0.70	0.68	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.70
Macon, Fort, N. C	-0.028	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Maginnis, Fort, Mont	+0.005	4.77	4.75	4.60	4.50	4.41	4.33	4.31	4.31	4.40	4.54	4.60	4.63
Marquette, Mich	+0.004	0.79	0.79	0.78	0.76	0.73	0.72	0.71	0.72	0.73	0.74	0.77	0.79
Memphis, Tenn	-0.027	0.33	0.33	0.32	0.31	0.31	0.30	0.30	0.30	0.31	0.31	0.33	0.33
Milwaukee, Wis	-0.005	0.80	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.78	0.80
Mobile, Ala	-0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Montgomery, Ala	-0.033	0.21	0.21	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.20	0.20	0.21
Moorhead, Minn	+0.005	1.11	1.10	1.08	1.04	0.98	0.97	0.96	0.97	1.00	1.02	1.07	1.12
Mount Washington, N. H	-0.002	6.63	6.62	6.52	6.41	6.18	6.12	6.07	6.08	6.15	6.34	6.56	6.63
Myer, Fort, Va	-0.016	0.29	0.29	0.28	0.28	0.27	0.26	0.26	0.26	0.26	0.27	0.28	0.29
Nashville, Tenn	-0.023	0.58	0.58	0.58	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.58	0.59
New Haven, Conn	-0.010	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.11	0.11	0.11
New London, Conn	-0.010	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
New Orleans, La	-0.039	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
New York City	-0.012	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	1.16	0.17	0.17	0.17
Norfolk, Va	-0.021	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
North Platte, Nebr	-0.010	3.10	3.08	3.04	2.94	2.85	2.78	2.78	2.78	2.86	2.94	3.06	3.14
Olympia, Wash	+0.005	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Omaha, Nebr	-0.010	1.24	1.23	1.22	1.18	1.14	1.13	1.12	1.12	1.14	1.16	1.22	1.25
Oswego, N. Y	-0.004	0.38	0.38	0.38	0.37	0.36	0.35	0.35	0.35	0.85	0.36	0.37	0.37
Palestine, Tex	-0.033	0.55	0.54	0.54	0.53	0.52	0.51	0.51	0.51	0.52	0.53	0.54	0.54
Pensacola, Fla	-0.038	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Philadelphia, Pa	-0.013	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12
Pike's Peak, Colo	-0.010	12.69	12.71	12.58	12.27	12.05	11.81	11.77	11.78	11.97	12.27	12.65	12.65
Pittsburg, Pa	-0.012	0.85	0.85	0.84	0.82	0.80	0.79	0.79	0.79	0.79	0.81	0.84	0.85
Poplar River, Mont	+0.008	2.36	2.36	2.31	2.21	2.13	2.11	2.07	2.09	2.16	2.23	2.30	2.37
Port Huron, Mich	-0.005	0.72	0.72	0.71	0.70	0.67	0.67	0.66	0.66	0.67	0.68	0.71	0.72
Portland, Me	-0.004	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Portland, Oreg	+0.002	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	0.08	0.08	0.08
Prescott, Ariz	-0.023	5.41	5.39	5.37	5.25	5.12	5.04	5.01	5.00	5.12	5.18	5.87	5.40
Red Bluff, Cal	-0.013	0.35	0.35	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.34	0.35	0.35
Rio Grande City, Tex	-0.047	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16
Rochester, N. Y	-0.005	0.70	0.70	0.70	0.68	0.65	0.65	0.64	0.64	0.65	0.67	0.69	0.71
Roseburg, Oreg	-0.005	0.55	0.55	0.55	0.54	0.54	0.53	0.53	0.53	0.53	0.54	0.55	0.55
Sacramento, Cal	-0.017	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Saint Louis, Mo	-0.017	0.63	0.62	0.62	0.60	0.58	0.58	0.57	0.57	0.58	0.60	0.62	0.63
Saint Michael's, Fort Alaska	+0.047	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Saint Paul, Minn	0.000	0.94	0.93	0.91	0.88	0.84	0.84	0.83	0.83	0.85	0.87	0.91	0.94
Saint Vincent, Minn	+0.011	0.99	0.98	0.96	0.92	0.87	0.86	0.85	0.86	0.88	0.91	0.95	1.00
Salt Lake City, Utah	-0.009	4.56	4.55	4.51	4.36	4.31	4.21	4.17	4.18	4.24	4.39	4.56	4.53
San Diego, Cal	-0.033	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sandusky, Ohio	-0.010	0.71	0.71	0.71	0.69	0.66	0.66	0.65	0.65	0.66	0.68	0.71	0.72
Sandy Hook, N. J	-0.012	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Sanford, Fla	-0.041	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
San Francisco, Cal	-0.019	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Santa Fé, N. Mex	-0.019	7.00	7.00	6.90	6.75	6.62	6.50	6.42	6.41	6.56	6.70	6.85	6.91
Savannah, Ga	-0.034	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06
Shaw, Fort, Mont	+0.005	3.87	3.86	3.81	3.68	3.61	3.58	3.52	3.54	3.62	3.71	3.83	3.84
Shreveport, La	-0.033	0.22	0.22	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.21	0.21	0.22
Sill, Fort, Ind. T	-0.025	1.30	1.28	1.26	1.21	1.19	1.17	1.17	1.17	1.19	1.23	1.28	1.30
Sitka, Alaska	+0.032	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Smithville, N. C	-0.029	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Spokane Falls, Wash	+0.007	2.15	2.14	2.14	2.07	2.06	2.05	1.99	2.01	2.05	2.09	2.09	2.14
Springfield, Ill	-0.014	0.70	0.69	0.68	0.66	0.65	0.61	0.63	0.64	0.65	0.66	0.68	0.70
Stockton, Fort, Tex	-0.032	3.11	3.10	3.05	3.00	2.98	2.89	2.91	2.91	2.93	3.00	3.09	3.11
Tatoosh Island, Wash	+0.009	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11
Thomas, Fort, Ariz	-0.029	2.80	2.80	2.75	2.70	2.61	2.60	2.56	2.59	2.61	2.68	2.81	2.79
Toledo, Ohio	-0.009	0.73	0.73	0.72	0.70	0.68	0.67	0.67	0.67	0.67	0.69	0.72	0.73
Totten, Fort, Dak	+0.008	1.78	1.76	1.73	1.67	1.60	1.57	1.55	1.56	1.60	1.65	1.72	1.81
Unalashka, Alaska	+0.024	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Vicksburg, Miss	-0.033	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.23	0.23
Washington City	-0.016	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.10	0.10	0.10	0.10
West Las Animas, Colo	-0.016	4.11	4.10	4.05	3.93	3.83	3.75	3.73	3.72	3.80	3.91	4.09	4.13
Wilmington, N. C	-0.029	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Winnemucca, Nev	-0.009	4.54	4.53	4.50	4.40	4.33	4.25	4.18	4.21	4.29	4.42	4.52	4.56
Yankton, Dak	-0.005	1.42	1.42	1.38	1.34	1.27	1.27	1.26	1.26	1.29	1.33	1.38	1.43
Yuma, Ariz	-0.033	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.12	0.12	0.12	0.12

Changes authorized since the beginning of the year 1885.

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Roseburg, Oreg[1]	−0.005	0.57	0.57	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.56	0.57	0.57
Cincinnati, Ohio[2]	−0.016	0.69	0.69	0.68	0.66	0.64	0.64	0.63	0.63	0.64	0.65	0.68	0.69
Montrose, Colo[3]	−0.017	6.00	6.00	5.93	5.75	5.63	5.50	5.46	5.47	5.60	5.76	5.96	6.02
Lamar, Mo[3]	−0.020	1.13	1.13	1.12	1.08	1.05	1.04	1.03	1.03	1.05	1.08	1.11	1.13
Vicksburg, Miss[4]	−0.033	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24
Do[5]	−0.033	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20
San Antonio, Tex[6]	−0.040	0.80	0.80	0.79	0.77	0.76	0.75	0.75	0.75	0.76	0.77	0.79	0.80
Port Angeles, Wash[3]	+0.008	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Portland, Me[7]	−0.004	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11
Saint Paul, Minn[7]	0.000	0,97	0.96	0.94	0.91	0.87	0.87	0.86	0.86	0.88	0.90	0.94	0.97
San Luis Obispo, Cal[3]	−0.026	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Concordia, Kans[3]	−0.015	1.54	1.53	1.51	1.47	1.42	1.40	1.39	1.39	1.42	1.46	1.51	1.54

[1] To date from January 1, 1885.
[2] After removal March 1, 1885.
[3] New station.
[4] After removal April 21, 1885.
[5] After removal June 1, 1885.
[6] Station reopened.
[7] After removal July 1, 1885.

APPENDIX 66 C.

Latitude, longitude, and elevation of Signal Service barometers.

[Prepared by Junior Professor H. A. Hazen.]

Station.	Latitude.	Longitude.	Elevation January 1, 1874.	Remarks.
	° ′	° ′	*Feet.*	
Albany, N. Y	42 39	73 45	75	Moved Oct. 1, 1884. H=83.
Alexander, Fort, Alaska	58 54	158 14	....	
Alpena, Mich	45 5	83 30	609	
Apache, Fort, Ariz	33 48	109 57	5,050 B	
Assinaboine, Fort, Mont	48 32	109 42	2,710 B	Moved March 12, 1884. H=2720 B.
Atlanta, Ga	33 45	84 23	1,129	
Atlantic City, N. J	39 22	74 25	18	
Augusta, Ga	33 28	81 54	183	
Baltimore, Md	39 18	76 37	45	
Barnegat, N. J	39 46	74 6	22	
Behring Island, Behring Sea	55 12	194 5	20	
Bennett, Fort, Dak	44 43	100 39	1,510 B	
Benton, Fort, Mont	47 50	110 40	2,694 B	Moved April 1, 1884. H=2681 B.
Bidwell, Fort, Cal	41 53	120 11	....	Established January 1, 1885.
Bismarck, Dak	46 47	100 38	1,694	
Block Island, R. I	41 10	71 36	27	
Boise City, Idaho	43 37	116 8	2,750 B	
Boston, Mass	42 21	71 4	142	Moved Oct. 1, 1884. H=125.
Bridger, Wyo	41 28	110 30	6,643 B	
Brownsville, Tex	25 53	97 26	59	Moved January 31, 1884. H=57.
Buffalo, N. Y	42 53	78 53	690	
Buford, Fort, Dak	48 0	103 56	1,930 B	
Cairo, Ill	37 0	89 10	359	See note at end.
Canby, Fort, Wash	46 16	124 4	179	
Cape Henry, Va	36 56	76 0	16	
Cape May, N. J	38 56	74 58	27	
Cape Mendocino, Cal	40 26	124 24	637	
Cedar Keys, Fla	29 8	83 2	22	
Charleston, S. C	32 47	79 56	52	
Charlotte, N. C	35 13	80 51	808	
Chattanooga, Tenn	35 4	85 15	783	
Cheyenne, Wyo	41 8	104 48	6,105	
Chicago, Ill	41 52	87 38	661	
Chincoteague, Va	37 55	75 23	18	Moved June 1, 1884. H=8.
Cincinnati, Ohio	39 6	84 30	612	Moved March 1, 1885. H=628
Cleveland, Ohio	41 30	81 42	690	
Colorado City, Tex	32 20	100 48	....	Established April, 1885.
Columbus, Ohio	39 58	83 0	812	

Latitude, longitude, and elevation of Signal Service barometers—Continued.

Station.	Latitude.	Longitude.	Elevation January 1, 1884.	Remarks.
	° ′	° ′	*Feet.*	
Concho, Fort, Tex	31 25	100 24	1,900 B	
Concordia, Kans	39 35	97 41	....	Established May 1, 1885. H=1384.
Custer, Fort, Mont	45 42	107 34	3,040 B	
Davenport, Iowa	41 30	90 38	615	
Davis, Fort, Tex	30 38	103 56	4,940	Moved March 3, 1884. H=4928 B.
Dayton, Wash	46 19	117 56	1,683 B	
Deadwood, Dak	44 23	103 43	4,600 B	
Delaware Breakwater, Del	38 48	75 10	20	
Denver, Colo	39 45	105 0	5,294	
Des Moines, Iowa	41 35	93 37	842	
Detroit, Mich	42 20	83 3	662	
Dodge City, Kans	37 45	100 0	2,517	
Dubuque, Iowa	42 30	90 44	665	
Duluth, Minn	46 48	92 6	687	Moved December 1, 1884. H=672.
Eastport, Me	44 54	66 59	61	
Elliott, Fort, Tex	35 30	100 21	2,650 B	
El Paso, Tex	31 47	106 30	3,764 B	
Erie, Pa	42 7	80 5	681	
Escanaba, Mich	45 48	87 5	612	Moved March 1, 1884. H=618.
Fort Smith, Ark	35 22	94 24	451	Moved February 1, 1885. H=470.
Frisco, Utah	38 25	118 16	....	Established January, 1885.
Galveston, Tex	29 18	94 47	40	
Grand Haven, Mich	43 5	86 18	620	
Grant, Fort, Ariz	32 39	109 57	4,860 B	Moved February 21, 1884. H=4856.
Greencastle, Ind	39 39	86 51	897	
Hatteras, N. C	35 15	75 40	12	
Helena, Mont	46 34	112 4	4,069	
Huron, Dak	44 21	98 9	1,305	
Indianapolis, Ind	39 46	86 10	766	
Indianola, Tex	28 32	96 31	26	
Jacksonville, Fla	30 20	81 39	43	
Keeler, Cal	36 35	117 50	....	Established February 1, 1885. Moved July 1, 1885. H=3622.
Keokuk, Iowa	40 22	91 26	618	
Key West, Fla	24 34	81 49	20	
Kitty Hawk, N. C	36 0	75 42	22	Moved November 1, 1884. H=9′.
Knoxville, Tenn	35 56	83 58	980	
La Crosse, Wis	43 49	91 15	725	
Lamar, Mo	37 32	94 15	....	Established February 26, 1885. H=1028.
Leavenworth, Kans	39 19	94 57	842	
Lewiston, Idaho	46 8	117 5	780 B	Moved January 1, 1885. H=785 B.
Little Rock, Ark	34 45	92 6	298	Raised April 1, 1884. H=299.
Los Angeles, Cal	34 3	118 15	357	
Louisville, Ky	38 15	85 45	551	
Lynchburg, Va	37 25	79 9	652	
Mackinaw City, Mich	45 47	84 39	605	
Macon, Fort, N. C	34 42	76 40	11	
Maginnis, Fort, Mont	47 12	109 10	4,340 B	
Marquette, Mich	46 34	87 24	673	
Memphis, Tenn	35 9	90 3	320	
Milwaukee, Wis	43 2	87 54	697	
Mobile, Ala	30 41	88 2	41	Moved July 1, 1884. H=35.
Montgomery, Ala	32 23	86 18	219	
Montrose, Colo	38 30	107 56	....	Established December, 1884. H=5825.
Moorhead, Minn	46 52	96 44	926	
Mount Washington, N. H	44 16	71 18	6279	
Nashville, Tenn	36 10	86 47	549	
New Haven, Conn	41 18	72 56	107	
New London, Conn	41 21	72 5	47	
New Orleans, La	29 58	90 4	52	
New York, N. Y	40 43	74 0	164	
Norfolk, Va	36 51	76 17	30	
North Platte, Nebr	41 8	100 45	2,841	
Olympia, Wash	47 3	122 53	36	
Omaha, Nebr	41 16	95 56	1,113	
Oswego, N. Y	43 29	76 35	304	Moved August 1, 1884. H=335.
Palestine, Tex	31 45	95 40	533	
Pensacola, Fla	30 25	87 13	30	
Philadelphia, Pa	39 57	75 9	92	Moved April 1, 1884. H=117.
Pike's Peak, Colo	38 50	105 2	14,134	
Pittsburg, Pa	40 32	80 2	771	
Poplar River, Mont	48 8	105 10	2,030 B	
Port Angeles, Wash	48 7	123 6	....	Established February 1, 1885. H=14.
Port Huron, Mich	43 0	82 26	633	
Portland, Me	43 39	70 15	45	Moved July 1, 1885. H=99.

Latitude, longitude, and elevation of Signal Service barometers—Continued.

Station.	Latitude.	Longitude.	Elevation January 1, 1884.	Remarks.
	° ′	° ′	*Feet.*	
Portland, Oreg	45 32	122 43	67	
Prescott, Ariz	34 33	112 28	5,340 B	Moved March 19, 1884. H=5,389 B.
Provincetown, Mass	42 3	70 11	26	Discontinued March 26, 1884.
Red Bluff, Cal	40 10	122 15	337	
Rio Grande City, Tex	26 23	98 48	230 B	
Rochester, N. Y	43 8	77 42	621	
Roseburg, Oreg	43 13	123 20	511	Moved August 22, 1884. H=523.
Sacramento, Cal	38 35	121 30	65	Moved February 1, 1884. H=64.
Saint Louis, Mo	38 38	90 12	571	
Saint Michael's, Fort, Alaska	63 28	161 48	30	
Saint Paul, Minn	44 58	93 3	801	
Saint Vincent, Minn	48 56	97 14	804	
Salt Lake City, Utah	40 46	111 54	4,348	
San Antonio, Tex	29 27	98 28	....	Re-established March 7, 1885. H=781.
San Diego, Cal	32 43	117 10	67	
Sandusky, Ohio	41 25	82 40	638	
Sandy Hook, N. J	40 28	74 00	28	
Sanford, Fla	28 48	81 23	50 B	Moved August 1, 1884. H=25 B.
San Francisco, Cal	37 48	122 26	60	
San Luis Obispo, Cal	35 18	120 39	....	Established June 1, 1885. H=270.
Santa Fé, N. Mex	35 41	105 57	....	Re-estab. Dec. 1, 1884. H=7026.
Savannah, Ga	32 5	81 5	87	
Shaw, Fort, Mont	47 31	111 48	3,550 B	
Shreveport, La	32 30	93 40	227	
Sill, Fort, Ind. T	34 40	98 23	1,200 B	
Sitka, Alaska	57 3	135 19	63	
Smithville, N. C	33 55	78 1	34	
Spokane Falls, Wash	47 40	117 25	1,906	Moved December 1, 1884. H=1909.
Springfield, Ill	39 48	89 39	644	
Stanton, Fort, N. Mex	33 30	105 26	....	Established January, 1885.
Stockton, Fort, Tex	30 53	102 53	3,010 B	
Tatoosh Island, Wash	48 23	124 44	86	
Thomas Camp, Ariz	33 4	110 2	2,710 B	
Toledo, Ohio	41 40	83 34	651	
Totten, Fort, Dak	47 57	98 57	....	Established May, 1884, H=1,500.
Unalaska, Alaska	53 53	166 32	13	
Valentine, Nebr	42 50	100 32	....	Established April 21, 1885.
Vicksburg, Miss	32 22	90 53	244	New office, April 21, 1885. H=252. Moved June 1, 1885. H=209.
Washington City	38 54	77 3	106	
West Las Animas, Colo	38 4	103 12	3,899	
Wilmington, N. C	34 14	77 57	52	
Winnemucca, Nev	40 58	117 43	....	Re-established December 1, 1884. H=4358.
Yankton, Dak	42 54	97 28	1,228	
Yuma, Ariz	32 45	114 36	141	

NOTE.—It will be noted that the elevation of the following stations differs from that in the last report by the amount set against each. Cairo, 18 feet; Cincinnati, 8; Indianapolis, 13; Louisville, 21; and St. Louis, 12. These changes are not due to a removal of office, but to a redetermination of the altitude by carefully connecting with the line of precise levels being run by the United States Coast and Geodetic Survey across the Continent from Sandy Hook to the Pacific.

The case of Cincinnati is especially instructive. The former elevation depended on a large number of canal and railroad levels, all of which appeared to check within a foot and yet the final result was in error by 8 feet. The difference of 29 feet between Louisville and Cincinnati has been noticed even in the reductions of barometer readings for the isobars on the daily maps.

When this line of levels has been completed, it will afford a most important base from which we may obtain elevations on either side and at many points where great uncertainties exist at present.

APPENDIX 66 D.

List of tornado reporters, June 30, 1885.

Name.	Post-office.	County.	State or Territory.
W. E. DeLap	Boscobel	Grant	Wisconsin.
Suel Foster	Muscatine	Muscatine	Iowa.
W. S. Dennet	Saco	York	Maine.
John J. Hubley	Menekaunee	Marinette	Wisconsin.
George Carrington	West Winsted	Litchfield	Connecticut.
Hervey Barber	Warwick	Franklin	Massachusetts.
J. C. Whitmore	Cordova	Rock Island	Illinois.
W. R. Gregg	Camden	Lyon	Minnesota.
C. W. Parsons	Providence	Providence	Rhode Island.
O. A. Archer	Blackington	Berkshire	Massachusetts.
Howard C. Lewis	Mount Holly	Burlington	New Jersey.
W. H. Higgins	Grant City	Sac	Iowa.
J. F. Lewellyn	Mexico	Audrain	Missouri.
O. P. Baer	Richmond	Wayne	Indiana.
Henry J. Grannis	High Forest	Olmstead	Minnesota.
Charles Kirchner	Waumandee	Buffalo	Wisconsin.
Clarence Gardner	Burlington	Des Moines	Iowa.
A. H. Peterson	Bath	Freeborn	Minnesota.
H. S. Terry	Utica	Winona	Do.
F. L. Sandford	Independence	Buchanan	Iowa.
R. W. Putnam	Ypsilanti	Washtenaw	Michigan.
J. W. Perkins	New Chester	Adams	Wisconsin.
Alexander Paul	Patch Grove	Grant	Do.
R. P. Colt	Poy Sippi	Waushara	Do.
George S. Card	Daisy	Hamilton	Tennessee.
H. Besse, jr	Butternut	Ashland	Wisconsin.
C. Keckley	Hillsborough	Fleming	Kentucky.
A. Norelins	Kiron	Crawford	Iowa.
John D. Dopf	Rockport	Atchison	Missouri.
Isaac H. Adams	Scranton	Green	Iowa.
Messrs. Webster and Corning	Briggsville	Marquette	Wisconsin.
Prof Henry M. McFarland	Hyde Park	Lamoille	Vermont.
R. J. Spurr	Greendale	Fayette	Kentucky.
Israel S. Scott	Kirk's Ferry P. O	Catahoula Parish	Louisiana.
Edwin L. Childs	Crete	Saline	Nebraska.
J. Sidner, jr	Loradale	Fayette	Kentucky.
Olef Olson	Deer Park	Saint Croix	Wisconsin.
Paul Roulet	Drury College, North Springfield.	Green	Missouri.
N. L. Smith	Centralia	Boone	Do.
William H. Pomeroy	Edgerton	Rock	Wisconsin.
James Amy	Saint Joseph	Tensas	Louisiana.
D. W. Briggs	Mount Sterling	Crawford	Wisconsin.
William M. Taylor	Herndon	Saline	Missouri.
G. H. Kallmeyer	Best Bottom	Montgomery	Do.
B. F. Ferris	Sunman	Ripley	Indiana.
W. B. Goodrich	Bingham	Somerset	Maine.
Joseph Luce	Pueblo	Pueblo	Colorado.
Irvine Prather	Russell Cave	Fayette	Kentucky.
W. H. Scofield	Cannon River Falls	Goodhue	Minnesota.
D. P. Davis, jr	South Bend	Blue Earth	Do.
Rev. A. A. Young	New Lisbon	Juneau	Wisconsin.
O. G. Wall	Lanesborough	Fillmore	Minnesota.
M. C. Thompson	Waverly	Pierce	Wisconsin.
E. P. Stearns	Etler	Dakota	Minnesota.
N. B. McKay	American City	Nemeha	Kansas.
P. W. Sears	Moravia	Appanoose	Iowa.
E. Silverberg	Peach Orchard	Clay	Arkansas.
C. G. Parker	Mount Vernon	Franklin	Texas.
T. E. Jenkins	Dawn	Livingston	Missouri.
E. G. Hubbell	Pittsfield	Berkshire	Massachusetts.
E. A. Goodnough	Oneida	Brown	Wisconsin.
H. W. Smith	Adair	Adair	Iowa.
J. C. Hatch	Loyd	Richland	Wisconsin.
T. Jewell	Star Prairie	Saint Croix	Wisconsin.
W. W. Moore	Gillett	Clay	Iowa.
T. A. Smith	Beloit	Rock	Wisconsin.
M. C. Waite	Baraboo	Sauk	Do.
W. E. Hull	Prior Lake	Scott	Minnesota.
E. L. Berthoud	Golden	Jefferson	Colorado.
B. Craig	Versailles	Woodford	Kentucky.
J. G. Lawton	De Pere	Brown	Wisconsin.
S. R. Rittenhouse	Reading	Berks	Pennsylvania.
S. M. Locke	Rockbury	Oxford	Maine.
J. S. Gerald	Beaver Falls	Renville	Minnesota.
August Sweger	Avalanche	Vernon	Wisconsin.
E. J. Gilkey	Strong	Franklin	Maine.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-Office.	County.	State or Territory.
Wilder Pratt	Freeman	Franklin	Maine.
A. Patrick	Grand Marsh	Adams	Wisconsin.
Rachael Larrabee	McGregor	Clayton	Iowa.
G. W. McDonald	Monticello	Wright	Minnesota.
J. J. Palmer	City Point	George	Virginia.
John Janzen	Mountain Lake	Cottonwood	Minnesota.
Arthur J. Carroll	Plainview	Wabasha	Do.
Henry Tucker	Otto	Clark	Indiana.
E. D. Winchester	Stacyville	Mitchell	Iowa.
Reuben Adams	Hersey	Saint Croix	Wisconsin.
William B. Pratt	Prattsburgh	Steuben	New York.
M. F. Billingsley	Franklin	Izard	Arkansas.
H. W. Pickens	Atalla	Etowah	Alabama.
John R. King	Island Lake	Lyon	Minnesota.
W. L. Wilkinson	Tettington	Charles City	Virginia.
E. D. Henry	Omro	Winnebago	Wisconsin.
J. S. Towle	New Avon	Redwood	Minnesota.
T. V. Munson	Dennison City	Grayson	Texas.
T. C. Craig	Easton	Leavenworth	Kansas.
O. Knight	Glendale	Henrico	Virginia.
G. B. Holden	Bacon	Monroe	Wisconsin.
Henry C. Terrell	Elmwood	Saline	Missouri.
William Welsh	Loyal	Clark	Wisconsin.
R. H. Kirk	Oxford	Chester	Pennsylvania.
C. L. Fellows	Fascoro	Kewaunee	Wisconsin.
John A. Wood	Rock Branch	Woodbury	Iowa.
William Smith	Marshfield	Webster	Missouri.
M. M. Beck	Holton	Jackson	Kansas.
R. B. Boulton	Millersburgh	Bourbon	Kentucky.
John Ingleby	Potsdam	Olmstead	Minnesota.
I. J. Wheeler	Monona	Clayton	Iowa.
J. G. Brandon	Poughkeepsie	Sharp	Arkansas.
Enoch L. Fogg	Woodstown	Salem	New Jersey.
J. L. Stowell	Bell Centre	Crawford	Wisconsin.
R. A. A. Morse	Gainesville	Sumpter	Alabama.
W. R. Allen	Pitman	Clay	Arkansas.
H. B. Wilson	Red Wing	Goodhue	Minnesota.
B. F. Jones	Beauregard	Copiah	Mississippi.
James H. Maxwell	Worthington	Nobles	Miunesota.
C. K. Baxter	Wells	Faribault	Do.
C. G. Witherspoon	Marystown	Johnson	Texas.
W. B. Clark	Beebe	White	Arkansas.
J. K. Gardner	New Hampton	Chickasaw	Iowa.
D. W. McNeal	Wendell	Cherokee	Do.
J. J. Webb	Fairview	Brown	Kansas.
W. A. Paddock	Ackerland	Leavenworth	Do.
W. D. Akers	Spring Valley	Pierce	Wisconsin.
George Stockmeyer	Fort Scott	Bourbon	Kansas.
H. A. Swain	Union Lake	Rice	Minnesota.
A. Patterson	Lee	Carter	Missouri.
D. L. Beaver	Reading	Berks	Pennsylvania.
J. O. Oien	Freedom	Waseca	Minnesota.
H. C. Rawson	Sturgis	Saint Joseph	Michigan.
Prof. H. E. Sadler	Emporia	Lyon	Kansas.
Edgar W. Clarke	Irvington	Washington	Illinois.
Robert O. Schoenfeleer	Wellington	Renville	Minnesota.
W. G. Bartley	Birch Cooley	do	Do.
A. E. Dolbear	College Hill	Middlesex	Massachusetts.
B. S. Hoxie	Albany	Green	Wisconsion.
E. O. Brauns	Tracy	Lyons	Minnesota.
J. H. Fawcett	Marion	Olmstead	Do.
John H. McGillan	Mackville	Outagamie	Wisconsin.
J. W. Dawson	Redfield	Spink	Dakota.
John Antry	Albertha	Randolph	Arkansas.
T. J. Reeves	Seney	Plymouth	Iowa.
P. Clawson	O'Keana	Butler	Ohio.
Arthur Borger	Wilson	Niagara	New York.
Henry M. Crombie	Glasgow	Trempealeau	Wisconsin.
D. F. Akin	Farmington	Dakota	Minnesota.
W. C. Talley	Marble Hill	Bollinger	Missouri.
James A. Shanker	Beaver Creek	Rock	Minnesota.
Martiu Bischoff	Buffalo	Erie	New York.
Henry D. A. Ward	Middletown	Middlesex	Connecticut.
S. W. Morrison	Oxford	Chester	Pennsylvania.
A. P. Jones	Little Wolf	Waupaca	Wisconsin.
E. A. Jones	Massillon	Stark	Ohio.
John L. Meagher	Marysburg	Le Sueur	Minnesota.
Frank Tilton	Green Bay	Brown	Wisconsin.
Charles G. Robinson	Campbellsburg	Washington	Indiana.
Frank J. Wise	Pine Bluff	Jefferson	Arkansas.
M. E. Paynter	Midway	Woodford	Kentucky.
John Alvey	Delavan	Fairbault	Minnesota.
A. W. Green	Greenville	Clay	Iowa.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
Prof. P. K. Pattison	Westfield	Chautauqua	New York.
C. N. Sawyer	Pattersonville	Sioux	Iowa.
E. C. Hildreth	Wheeling	Ohio	West Virginia.
John C. Whiteside	Loutre Island	Montgomery	Missouri.
Edwin H. Cox	Pekin	Niagara	New York.
Rev. F. M. Eckstein	Conception	Nodaway	Missouri.
Robert Lynn	Acton	Pembina	Dakota.
Charles G. Boernor	Vevay	Switzerland	Indiana.
G. F. Hunter	Hawarden	Sioux	Iowa.
Walter S. Booth	Minneapolis	Hennepin	Minnesota.
Mrs. B. W. Randall	Sharon	Le Sueur	Do.
C. M. Widman	Grand Coteau	Saint Landry	Louisiana.
T. M. Barton	Butler	Pendleton	Kentucky.
C. Shaler Smith	Saint Louis	Saint Louis	Missouri.
George Durkee	De Forest	Dane	Wisconsin.
K. M. Hutchinson	Oshkosh	Winnebago	Do.
J. N. Prouty	Humboldt	Humboldt	Iowa.
William Prescott	Bear Valley	Wabasha	Minnesota.
A. I. Drake	Cascade	Goodhue	Do.
John De Boos	Bigelow	Nobles	Do.
C. H. Honey	Kensington	Walsh	Dakota.
Charles J. Ellis	Marinette	Marinette	Wisconsin.
F. M. Green	Whiting	Jackson	Kansas.
E. Whitcomb	Friend	Saline	Nebraska.
Albert Campbell	Adrian	Nobles	Minnesota.
James Reed	Avalon	Livingston	Missouri.
C. Steffens	Fraser	Macomb	Michigan.
A. Gould	Spring Lake	Kingsbury	Dakota.
John O'Bryan	Garfield	Jackson	Wisconsin.
N. M. Cook	729 Eleventh avenue, N. Minneapolis.	Hennepin	Minnesota.
D. H. Morgan	Albany	Green	Wisconsin.
R. W. Neff	Nevada	Mercer	Kentucky.
James H. Haight	Lowville	Columbia	Wisconsin.
L. P. Miller	High Hill	Montgomery	Missouri.
George Fairfield	Bridgeport	Crawford	Wisconsin.
W. S. Prather	North Vernon	Jennings	Indiana.
A. D. Bundy	Saint Ansgar	Mitchell	Iowa.
F. Frederick	Cross Plains	Dane	Wisconsin.
J. C. Risk	Canton	Lewis	Missouri.
John H. Brown	Fair Water	Fond du Lac	Wisconsin.
Henry Schildt	Mazo Manie	Dane	Do.
E. F. Lewis	Lewiston	Columbia	Do.
Emma M. Smith	Mendota	Dane	Do.
J. C. Fales	Danville	Boyles	Kentucky.
J. M. Elder	Concord	Hancock	Iowa.
Charles A. Kendall	Barry	Pike	Illinois.
John Regan	Elmwood	Peoria	Do.
Alexander Hawkin	West Newton	Nicollet	Minnesota.
Thomas J. Felzer	Enterprise	Winona	Do.
G. H. Yapp	Waucousta	Fond du Lac	Wisconsin.
Andrew W. Pederson	Comfrey	Brown	Minnesota.
C. H. Benton	Dodge Centre	Dodge	Do.
John Collet	Indianapolis	Marion	Indiana.
J. Shaw	Chester	Olmstead	Minnesota.
Joseph Boyd	Oskaloosa	Mahaska	Iowa.
E. A. Hickman	Independence	Jackson	Missouri.
C. P. Parsons	Spaulding	Hamlin	Dakota.
J. F. Martin	Effingham	Atchison	Kansas.
G. A. Goff, jr	Elmira	Chemung	New York.
George S. Barnes	Handy	Rock	Minnesota.
Erasmus Haworth	Oskaloosa	Mahaska	Iowa.
Nathaniel Shute	Exeter	Rockingham	New Hampshire.
E. Tracy Brown	Hanover	Rock	Wisconsin.
F. H. King	River Falls	Pierce	Do.
A. M. Carter	Johnstown	Rock	Do.
H. M. Weston	Greenwood	Clark	Do.
P. E. Orear	Orearville	Saline	Missouri.
E. Hildebrand	Philadelphia	Philadelphia	Pennsylvania.
Mrs. P. H. Mell	Auburn	Lee	Alabama.
Oscar J. Lawrence	Arlington	Tarrant	Texas.
E. A. Gore	Marshall	Lyon	Minnesota.
Peter Wodzynski	Stoddard	Vernon	Wisconsin.
George R. Cather	Ashville	Saint Clair	Alabama.
C. G. Edwards	Spring Valley	Fillmore	Minnesota.
William J. Waggoner	Viola	Richland	Wisconsin.
E. S. Mitchell	Tigerton	Shawano	Do.
R. S. Morse	Beetown	Grant	Do.
George Davy	Ottawa	Waukesha	Do.
A. F. Berry	Springville	Lawrence	Indiana.
S. N. Kingsley	Loganville	Sauk	Wisconsin.
Mrs. J. Campbell	Sibley	Osceola	Iowa.
John T. Bedally	Trim Belle	Pierce	Wisconsin.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
G. B. Brackett	Denmark	Lee	Iowa.
H. P. Hanson	Haywood	Freeborn	Minnesota.
J. H. J. Williams	Doran's Cave	Jackson	Alabama.
E. F. Test	Omaha	Douglas	Nebraska.
Spencer Haines	Rancocas	Burlington	New Jersey.
James B. Wallace	Mount Pleasant	Westmoreland	Pennsylvania.
J. Reimers	Calumet Harbor	Fond du Lac	Wisconsin.
Abraham Vines	Vine's Springs	Ripley	Indiana.
J. B. Porter	Silver Creek	Floyd	Georgia.
W. B. Strong	Northfield	Rice	Minnesota.
Daniel James	Yarnallton	Fayette	Kentucky.
E. M. Shepard	Springfield	Green	Missouri.
Robert Severs	Washington Harbor	Door	Wisconsin.
Ellwood Cooper	Santa Barbara	Santa Barbara	California.
Edward Newhouse	Edwards	Sheboygan	Wisconsin.
C. Bonnin	Bondnel	Shawano	Do.
L. Stowe	Sun Prairie	Dane	Do.
J. T. Davenport	Whitesburg	Carroll	Georgia.
Thomas L. Wakeley	Germania	Calhoun	Alabama.
J. J. B. McElrath	Centre	Cherokee	Do.
E. R. Memminger	17 Broad st., Charleston.	Charleston	South Carolina.
Colin Macrar	Camden	Kershaw	Do.
J. S. Stewart	Oxford	Newton	Georgia.
R. L. Rhodes	Hephzibah	Richmond	Do.
Henry D. Capers	Adairsville	Barton	Do.
W. M. Chapel	Kingston	Green Lake	Wisconsin.
George H. Larison	Lambertville	Hunterton	New Jersey.
K. C. Pope	Battleborough	Edgecombe	North Carolina.
George L. De Hines	Hope Station	Lexington	South Carolina.
E. Parsons	Dallas	Gaston	North Carolina.
T. G. Patrick	White Oak	Fairfield	South Carolina.
H. F. Walker	Jackson Station	Aiken	Do.
John T. Hardie	67 Carondelet street	New Orleans	Louisiana.
Levi Clippinger	Centralia	Nemaha	Kansas.
Albert Rawlins	Eastland	Eastland	Texas.
A. I. Laing	Dale	Cottonwood	Minnesota.
J. H. Brownlee	Plainsville	Gordon	Georgia.
John Minor	Sun Hill	Washington	Do.
John C. Glover	Batesburg	Lexington	South Carolina.
W. F. Brewer	Duluth	Gwinnett	Georgia.
Mary R. Dusenberg	Concord	Cabarrus	North Carolina.
G. P. Harley	Allendale	Barnwell	South Carolina.
W. H. Hatfield	Hollywood	Richland	Georgia.
D. L. Cheatham	Davidsborough	Washington	Do.
Grace G. Cochran	Anderson	Anderson	South Carolina.
J. M. Bivins	Albemarle	Stanley	North Carolina.
W. J Goss	Harmony Grove	Jackson	Georgia.
E. McRae	Wadesborough	Anson	North Carolina.
James E. Crossland	Aiken	Aiken	South Carolina.
V. B. Clark	Blountsville	Jones	Georgia.
L. Holt	Siluria	Shelby	Alabama.
N. A. Whitmore	Canton	Cherokee	Georgia.
J. K. Milner	Columbiana	Shelby	Alabama.
James Smith	Lexington	Davidson	North Carolina.
D. A. Jordan	Jackson	Northampton	Do.
William T. Hamilton	Talking Rock	Pickens	Georgia.
E. Rumble	Gogginsville	Monroe	Do.
Sampson Pope	Newberry	Newberry	South Carolina.
W. C. Rose	Timmonsville	Darlington	Do.
John H. Frick	Warrenton	Warren	Missouri.
J. M. Pugh	Morrisville	Wake	North Carolina.
O. S. Jones	Manly	Moore	Do.
Thomas W. Halloway	Pomaria	Newberry	South Carolina.
James A. Dunlap	Cedar Hill	Anson	North Carolina.
Mrs. H. N. Sutton	Big Creek	Forsyth	Georgia.
M. H. Allen	Beverly	Anson	North Carolina.
J. H. Hendly	Ansonville	Anson	Do.
H. H. Guernsey	Altamont	Deuel	Dakota.
D. F. Waite	Byron	Houston	Georgia.
E. A. S. Mixon	Barnwell	Barnwell	South Carolina.
James H. Paw	Smithfield	Johnston	North Carolina.
L. H. Boyken	Brooks' Station	Fayette	Georgia.
T. J. Gray	Choctaw Agency	Oktibbeha	Mississippi.
Dr. William W. Twitty	Camilla	Mitchell	Georgia.
Professor J. E. Davies	Madison	Dane	Wisconsin.
J. N. Garrison	Gillsville	Banks	Georgia.
W. W. Crosby	Crosbyville	Chester	South Carolina.
John W. Lutz	Cave Springs	Bullitt	Kentucky.
R. A. Goher	Dougherty	Dawson	Georgia.
R. R. Irby	Linton	Hancock	Do.
C. Lightfoot	Pelham	Mitchell	Do.
W. J. Y. Thurston	Clayton	Johnston	North Carolina.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
A. M. McMullen	Landsford	Chester	South Carolina.
Richard L. Rowe	Rock Valley	Sioux	Iowa.
J. A. Parham	Lockville	Chatham	North Carolina.
R. B. McArver	Coosa	Floyd	Georgia.
William M. Jones	Cary	Wake	North Carolina.
J. C. Goodman	Goodman	Anson	Do.
J. S. Stewart, jr	Cave Spring	Floyd	Georgia.
Jackson Counts	Peak	Lexington	South Carolina.
B. F. Benton	Raymond	Union	North Carolina.
C. C. Chandler	Bascobel	Jackson	Georgia.
Alexander A, Beard	Wilsonville	Spencer	Kentucky.
W. C. Baskins	Coats Bend	Etowah	Alabama.
C. Martin	Martin's Cross Roads	Calhoun	Do.
A. S. Marsh	Harrisburg	Saline	Illinois.
Charles De St. Roseana	Augusta	Richmond	Georgia.
James McFarlane	Towanda	Bradford	Pennsylvania.
J. M. Head, jr	Linwood	Pike	Alabama.
W. B. Spencer	Murfreesborough	Hertford	North Carolina.
S. Pierson	Enfield	Halifax	Do.
F. J. Blackwell	Lavonia	Franklin	Georgia.
W. Nelson	Smith's Turn Out	York	South Carolina.
John Goodrich	Enfield	Halifax	North Carolina.
W. F. Watson	Watsonville	Rowan	Do.
R. C. Alexander	Homer	Banks	Georgia.
R. M. Raymond	Hailes Gold Mine	Lancaster	South Carolina.
J. M. Campbell	Oak Grove	Union	North Carolina.
Henry S. Glover	Monticello	Jasper	Georgia.
W. B. Smith	Tumbling Shoals	Laurens	South Carolina.
Marvel Ritchie	Copal Grove	Stanley	North Carolina.
M. F. Huntley	Lane's Creek	Union	Do.
J. T. Rose	Indian Trail	do.	Do.
S. Buckley	New Providence	Montgomery	Tennessee.
Arthur Harvin	Oakland	Clarendon	South Carolina.
C. W. Stanton	Elk City	Montgomery	Kansas.
R. J. Harper	Sandy Ridge	Henry	Georgia.
W. H. S. Harris	Jonesville	Union	South Carolina.
G. H. Hannah	South Bosque	McLennan	Texas.
James C. Klugh	Abbeville	Abbeville	South Carolina.
J. W. Majors	Majors	Anderson	Do.
J. J. Talley	Lovelace	Troup	Georgia.
Ansel Strickland	Cummings	Forsyth	Do.
Thad C. Sturgis	Columbus	Muscogee	Do.
Chas. Nickerson	Big Creek	Edgefield	South Carolina.
John W. Caldwell	Clarksville	Montgomery	Tennessee.
J. A. Keller	Tunnel Hill	Hardin	Kentucky.
C. E. Bessey	Ames	Storey	Iowa.
Edward B. Smith	Smithsborough	Jasper	Georgia.
I. Varenberg	Paint Rock	Jackson	Alabama.
H. Good	Marietta	Greenville	South Carolina.
J. M. Dorsey	Massey Creek	White	Georgia.
R. W. Boyd	Darlington	Darlington	South Carolina.
Thos. B. Dedrer	Little Warrior	Blount	Alabama.
Edgar L. Larkin	New Windsor	Mereer	Illinois.
James O. Ladd	Cheraw	Chesterfield	South Carolina.
B. C. Smith	Cold Water	Elbert	Georgia.
I. A. Ledbetter	Edinborough	Montgomery	North Carolina.
W. F. Brookshine	Powelton	Richmond	Do.
E. W. Griffith	Ozark	Dale	Alabama.
L. M. Burkett	Pine Ridge	Twiggs	Georgia.
T. W. Methvin	Senoia	Coweta	Do.
P. D. Huff	Saint Albans	Greenville	South Carolina.
J. R. Culp	Rossville	Chester	Do.
William Gesner	Birmingham	Jefferson	Alabama.
William Bradley	Mapleton	Abbeville	South Carolina.
C. E. Greene	Long Cane	Troup	Georgia.
J. J. Bunch	Poverty Hill	Edgefield	South Carolina.
D. C. Hodo	Carrollton	Pickens	Alabama.
W. H. Jones	Ringwood	Halifax	North Carolina.
Charles S. Prosser	Ithaca	Tompkins	New York.
P. P. Maxwell	Davidson College	Mecklenburgh	North Carolina.
John M. Vean	Neillsville	Clark	Wisconsin.
George H. Carter.	Carter's Mills	Moore	North Carolina.
Charles D. Chappell	Jenkinsville	Fairfield	South Carolina.
W. T. Holland	Marion Station	Lauderdale	Mississippi.
H. D. Ingersoll	Dahlonega	Lumpkin	Georgia.
C. B. La Hatte	Gainesville	Hall	Do.
R. P. Collins	Hanrahan	Pitt	North Carolina.
W. S. Sanford	Livingston	Floyd	Georgia.
Jer. S. Bray	Foust's Mills	Randolph	North Carolina.
D H. Hepler	Hannersville	Davidson	Do.
W. P. Coker	Cedar Grove	Laurens	South Carolina.
J. B. Wright	High Tower	Forsyth	Georgia.
Jacob W. Whorton	Forney	Cherokee	Alabama.

List of tornado reporters, June 30, 1885—Continued.

Names.	Post-office.	County.	State or Territory.
Josiah E. Pridgen	Key	Cherokee	Alabama.
John B. Boyd	Sonora	Gordon	Georgia.
George B. Tillton	Aurora	Kane	Illinois.
Irvin F. Smith	Lansing	Ingham	Michigan.
J. A. Salter	Crawford	Lowndes	Mississippi.
W. A. Ellington	Beaumont	Chatham	North Carolina.
James L. Strain	Etta Jane	Union	South Carolina.
E. E. Barnard	Vanderbilt University.	Nashville	Tennessee.
T. J. Lake	Athens	Limestone	Alabama.
A. J. Phinney	Muncie	Delaware	Indiana.
F. J. Hay	Liberty Hill	Kershaw	South Carolina.
W. T. McGlothlin	Richland Station	Sumner	Tennessee.
G. P. Lloyd	Winfred	Jasper	Georgia.
J. S. Wright	Duncans	Spartanburgh	South Carolina.
J. M. Dill	Clay Hill	Lincoln	Georgia.
W. T. Henderson	Coronaca	Abbeville	South Carolina.
Samuel D. McGill	Camp Ridge	Williamsburgh	Do.
W. M. Dalton	Dido	Choctaw	Mississippi.
John N. Miller	Glenn Springs	Spartanburgh	South Carolina.
William A. Love	Crawford	Lowndes	Mississippi.
J. F. Smith	Cedar Grove	Walker	Georgia.
W. J. Taylor	Cloverdale	Dade	Do.
J. W. Rosamond	Brushy Creek	Anderson	South Carolina.
C. D. Williamson	Big Oak	Moore	North Carolina.
George D. Norris	New Market	Madison	Alabama.
Henry D. Bennett	Guntersville	Marshall	Do.
I. E. Goodgion	Goodgion's Factory	Laurens	South Carolina.
B. F. Grady	Albertsons	Duplin	North Carolina.
A. P. Murray	Albany	Delaware	Indiana.
I. D. Love	Oktibbeha	Oktibbeha	Mississippi.
H. Benedict	Springport	Henry	Indiana.
Frank Burns	Blountsville	Blount	Alabama.
John S. Walser	Riches	Sauk	Wisconsin.
C. L. Williams, jr.	Nacoochee	White	Georgia.
J. W. Each	Holland's Store	Anderson	South Carolina.
I. R. Littlejohn	Asbury	Union	Do.
Silas C. Turnbo	Protem	Taney	Missouri.
J. W. Sessoms	Bethlehem	Hertford	North Carolina.
I. L. Guthridge	Mingo	Champaign	Ohio.
C. G. Wilson	Milledgeville	Baldwin	Georgia.
James A. Garvin	Newton	Catawba	North Carolina.
James H. Bishop	Beulaville	Duplin	Do.
W. A. Montgomery	Cross Plains	Calhoun	Alabama.
J. W. Gore	Chapel Hill	Orange	North Carolina.
John McColn	Strafford	Greene	Missouri.
W. B. King	Black-Jack	Robertson	Tennessee.
G. J. N. Wilson	Jefferson	Jackson	Georgia.
J. A. Roberts	Campbell	Knox	Tennessee.
C. H. Egolf	Etna	Licking	Ohio.
K. T. Daniell	Cross Plains	Calhoun	Alabama.
Seaborn Kitchens	Gibson	Glascock	Georgia.
J. M. Henderson	Stout	Union	North Carolina.
J. S. Renninger	Minnesota	Lyon	Minnesota.
Charles Ambrose, jr	Millersport	Fairfield	Ohio.
W. C. Barkin	Coats Bend	Etowah	Alabama.
J. E. Willet	Macon	Bibb	Georgia.
Charles A. Beam	Beamville	Allegheny	Pennsylvania.
G. B. Telford	Grove Level	Banks	Georgia.
William P. Hoy	Millville	Spartanburgh	South Carolina.
William Riley	Ohio	Anderson	Do.
B. F. Grigg	Lincolnton	Lincoln	North Carolina.
A. J. McCall	Bath	Steuben	Do.
Charles Moore	Pottstown	Montgomery	Pennsylvania.
A. Sharpless	West Chester	Chester	Do.
J. N. Smith	Mount Summit	Henry	Indiana.
C. M. Hunt	Gamble's Store	Rutherford	North Carolina.
L. M. Werts	Clouds Creek	Edgefield	South Carolina.
W. H. Pratt, secretary Academy of Natural Science.	Davenport	Scott	Iowa.
F. E. Jerome	Russell	Russell	Kansas.
John Covert	Oregon	Clark	Indiana.
John R. Shaffer	Fairfield	Jefferson	Iowa.
F. E. Charlesworth	Ledyard	Outagamie	Wisconsin.
A. T. Fuller	Hogansville	Troup	Georgia.
M. W. Coulter	Columbus	Cherokee	Kansas.
T. F. Warner	Platte City	Platte	Missouri.
A. B. Braydon	Monroe	Monroe	Michigan.
Frank P. Hall	Edina	Knox	Missouri.
S. A. Day	Osawatomie	Miami	Kansas.
Geo. Ware	Washington	Wilkes	Georgia.
Miss E. Foster	Newton	Sussex	New Jersey.
Martin Clark	Sutton	Clay	Nebraska.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
A. S. Currey	Trenton	Gibson	Tennessee.
A. M. Gibson	Chepultepec	Blount	Alabama.
A. D. Cadwallader	Lincoln	Logan	Illinois.
W. B. Jones	Herndon	Burke	Georgia.
D. W. Brainard	Grinnell	Poweshiek	Iowa.
J. W. Groesbeck	Harvard	McHenry	Illinois.
Alfred S. Franklin	Covington	Newton	Georgia.
James Seaborn	Fair Play	Oconee	South Carolina.
D. C. Neff	Day	Clark	Wisconsin.
T. B. Headford	Essexville	Bay	Michigan.
W. M. Owen	Crothersville	Jackson	Indiana.
T. J. Painter	Connesauga	Murray	Georgia.
W. S. Ruckel	De Witt	Carroll	Missouri.
I. A. Ward	Troy	Lincoln	Do.
W. C. Stovall	Rock Mart	Polk	Georgia.
L. M. Putnam	Swain	Spartanburg	South Carolina.
A. B. Woodruff	Woodruffs	do	Do.
James S. Robinson	Willington	Abbeville	Do.
A. P. Trautwein	Office of Continental Works.	Greenpoint	New York.
W. A. Battaile	Mobile	Mobile	Alabama.
J. W. Knight	Racine	Racine	Wisconsin.
J. R. Spencer	Arilla	Jasper	Missouri.
Prof. C. P. Conrad	Fayetteville	Washington	Arkansas.
S. E. Hocker	Georgetown	Ottawa	Kansas.
Dr. S. B. Bowles	Greenfield	Dade	Missouri.
Robert Woody	Crayton	Fannin	Georgia.
Dr. R. C. Kedgie	Agricultural College	Lansing	Michigan.
H. H. Clayton	Murfreesborough	Rutherford	Tennessee.
J. F. Hopkins	Mabelvale	Pulaski	Arkansas.
B. H. Sellmeyer	Knobel	Clay	Do.
J. R. Woodfill	Verona	Lawrence	Missouri.
J. W. Ingles	Pleasant Hill	Saline	Nebraska.
Dr. James Davis	Kellogg	Wabasha	Minnesota.
W. R. Lesser	Tama City	Tama	Iowa.
Samuel R. Weed	Wabaunsee	Wabaunsee	Kansas.
E. D. Springer	South Creek	Beaufort	North Carolina.
W. T. Boyse	Long Branch	Saline	Illinois.
H. Eastland	Forest	Scott	Mississippi.
Lee S. Cobb	Onondaga	Ingham	Michigan.
A. E. McGoffin	Lyons	Rice	Kansas.
B. B. Barry	Pollocksville	Jones	North Carolina.
A. W. Wilmarth	Embarrass	Waupaca	Wisconsin.
E. S. Griffin	Rices	Pickens	South Carolina.
H. D. Olds	Cedar Rapids	Linn	Iowa.
Stephen Chapman	Bloomfield	Stoddard	Missouri.
John L. Tunnell	Ozark	Christian	Do.
Rev. Ira R. Hicks	Pinkelville, West Saint Louis	Saint Louis	Do.
C. J. Bayer	Cedar Rapids	Linn	Iowa.
J. M. Martin	Corinth	Alcorn	Mississippi.
Dr. Frank Prince	Jonesborough	Jefferson	Alabama.
William Dunlap	Wolf Creek	Saint Clair	Do.
W. C. Mathews	Tennille	Washington	Georgia.
G. W. Clements	De Armanville	Calhoun	Alabama.
S. A. Harris	Dawson's Cross R'ds	Halifax	North Carolina.
William A. McCresless	Albertville	Marshall	Alabama.
Benjamin F. Dorsey	Jasper	Pickens	Georgia.
Benjamin P. Berry	Brownsville	Blount	Alabama.
R. A. Rouse	Scranton	Williamsburgh	South Carolina.
D. A. Montgomery	Pleasant Ridge	Green	Alabama.
J. H. Spote	Stokes Bridge	Darlington	South Carolina.
F. H. Dover	Whitaker	York	Do.
William W. Kinezey	Diamond	Gilmer	Georgia.
J. J. A. Sharp	Walesco	Cherokee	Do.
H. C. Moore	Macon	Bibb	Do.
H. T. Bernes	Worthville	Butts	Do.
W. K. Sharp	Townville	Anderson	South Carolina.
W. E. Manning	Spring Hope	Nash	North Carolina.
George Wilcox	Carbonton	Moore	Do.
G. E. Weber	Opelika	Lee	Alabama.
R. T. Rush	Harrisville	Montgomery	North Carolina.
H. D. Mason	William's Mills	Chatham	Do.
E. C. Smith	Toad Vine	Jefferson	Alabama.
Augustus S. Erwin	Grace	Lumpkin	Georgia.
John G. Finley	Bruner	Calhoun	Alabama.
W. J. Bell	Gaffney City	Spartanburgh	South Carolina.
J. B. Jones	Herndon	Burke	Georgia.
W. A. Spencer	Peoples	Laurel	Kentucky.
John H. Dent	Cave Spring	Floyd	Georgia.
S. A. Gregg, jr	Mars Bluff	Marion	South Carolina.
John F. Bishop	Woodville	Jackson	Alabama.
George A. Vance	Mound Valley	Labette	Kansas.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
Sylvester Flagler	Whitehall	Trempealeau	Wisconsin.
J. B. Britton	Pine Log	Bartow	Georgia.
H. G. Reed	Anderson	Anderson	South Carolina.
J. M. Robertson	Laurens	Laurens	Do.
S. E. Freeland	Plum Branch	Edgefield	Do.
B. H. McEckron	Concordia	Cloud	Kansas.
Paul Quattlebaum	Leesville	Lexington	South Carolina.
H. C. Russell	Eufaula	Barbour	Alabama.
Col. George H. Faribault	Archer Lodge	Johnston	North Carolina.
George E. Lodsham	Pacolet	Spartanburgh	South Carolina.
A. E. Sturgis	Thompson	McDuffie	Georgia.
W. A. McLane	Abbeville	Wilcox	Georgia.
B. Niblack	Virgil	Jackson	Do.
S. E. McMillan	Tabernacle	Marion	South Carolina.
L. C. Coulson	Scottsborough	Jackson	Alabama.
J. S. Jossey	Maynard	Monroe	Georgia.
J. H. Stephenson	Flat Rock	Kershaw	South Carolina.
G. V. Young	Waverly	Clay	Mississippi.
Isaac T. Wilson	Trenton	Jones	North Carolina.
Dr. G. G. Whitcomb	Ogretta	Cherokee	Do.
G. A. Tike	Damascus	Spartanburgh	South Carolina.
James G. Van Frank	Kasson	Dodge	Minnesota.
W. A. Hunter	Hunters	Abbeville	South Carolina.
J. P. G. Campbell	Trenton	Smith	Mississippi.
I. F. Caveness	Buffalo Ford	Randolph	North Carolina.
L. S. Fuller	Lisbon	Laurens	South Carolina.
Dr. John M. Surface	Lake City	Jackson	Missouri.
J. Frank Folger	Pickens C. H.	Pickens	South Carolina.
T. A. Bereman	Mount Pleasant	Henry	Iowa.
J. Shuster	Farmersville	Union	Louisiana.
S. O. Middleton	Hallsville	Duplin	North Carolina.
T. J. Cowden	Grief	Bradley	Tennessee.
H. Edmund Ravenel	Keowee	Oconee	South Carolina.
John Inman	Somerset	Pulaski	Kentucky.
K. Robertson	Mountain Home	Baxter	Arkansas.
Ignatius F. Reese	Oneal	Greenville	South Carolina.
William Bell	Osage	Mitchell	Iowa.
Dr. D. W. Dunn	Chatauqua	Chatauqua	Kansas.
Robert L. Steele	Rockingham	Richmond	North Carolina.
Dr. E. T. McSwain	Cross Hill	Laurens	South Carolina.
B. Bowers	Bowersville	Hart	Georgia.
W. August Fonda	Carroll	Carroll	Iowa.
Jos. Cohen	Alfonte	Madison	Indiana.
Thomas Dalton	Green Mount	Laurel	Kentucky.
W. F. Houseal	Little Mountain	Lexington	South Carolina.
Z. D. Smith	Zadoc	York	Do.
Amasa Cobb	Beloit	Mahoning	Ohio.
William Curry	Blue Hill	Webster	Nebraska.
A. C. McIntosh	Taylorsville	Alexander	North Carolina.
H. L. Seib	Hamburg	Saint Charles	Missouri.
John T. Camp	Gillsville	Hall	Georgia.
D. R. Elkin	Alston	Fairfield	South Carolina.
M. H. Ganong	Fort Atkinson	Jefferson	Wisconsin.
George W. Johnson	Campagne	Towns	Georgia.
Jos. Haberthier	Bridgeport	Warren	Missouri.
J. O. Perry	Troup Factory	Troup	Georgia.
N. S. Whitney	Edwardsville	Madison	Illinois.
Robert A. Wood	Woodburn	Macoupin	Do.
Hunter & Robinson	Belton	Bell	Texas.
W. F. Manuel	Mortonsville	Woodford	Kentucky.
A. Cookendarfer	Berlin	Bracken	Do.
Dr. A. M. Bourland	Van Buren	Crawford	Arkansas.
C. W. Stanton	Elk City	Montgomery	Kansas.
Dr. I. Humphrey	Fairbury	Jefferson	Nebraska.
Prof. J. H. Cook	Columbus	Cherokee	Kansas.
F. W. Doe	Claremont	Dodge	Minnesota.
Dr. J. W. Jacobs	Mount Hor	Bracken	Kentucky.
D. D. Parry	Monmouth	Warren	Illinois.
A. O. McCreery	Wetmore	Nemaha	Kansas.
Prof. A. Howell	White Plains	Greene	Georgia.
G. P. Clarke	Decatur	Newton	Mississippi.
W. F. Hill	Mountaintown	Gilmer	Georgia.
Dr. S. Laning	Kingman	Kingman	Kansas.
J. P. D. Murphy	Bear Creek	Randolph	Alabama.
Otis Ashmore	Harlem	Columbia	Georgia.
Dr. R. Hicks	Hickville	Rutherford	North Carolina.
J. B. Dickson	Locust Grove	Henry	Georgia.
M. D. Kirk	Sturgis	Saint Joseph	Michigan.
I. Ash	Alexander	Pulaski	Arkansas.
G. B. Cowley	Glassville	Caldwell	Missouri.
I. M. Peeler	Pine Grove	Union	South Carolina.
N. W. Kuhn	Appleton	Pope	Arkansas.
Henry Little	Kalamazoo	Kalamazoo	Michigan.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
T. A. McAlister	Calhoun's Mills	Abbeville	South Carolina.
P. J. N. Wilson	Jefferson	Jackson	Georgia.
W. D. Humphrey	Isney	Choctaw	Alabama.
B. A. Strange	Ellaville	Schley	Georgia.
J. W. Edwards	Woodstock	Cherokee	Do.
N. W. Bonton, M. D	Ashland	Benton	Mississippi.
W. C. Bookin	Coat's Bend	Etowah	Alabama.
L. Shaucke	Dell	Faribault	Minnesota.
Albert G. Williams	Blue Spring	Jackson	Missouri.
B. F. O'Kelly	Planter	Madison	Georgia.
M. P. White	Whiton	De Kalb	Alabama.
A. P. Sims	Morton	Scott	Mississippi.
Wesley Ohl	West Austintown	Mahoning	Ohio.
J. K. Allen	Alliance	Stark	Do.
W. F. Rice	Draper	Jasper	Iowa.
Benjamin Morgan	Richland	Keokuk	Do.
Charles L. Davis	Warm Springs	Meriwether	Georgia.
N. E. Goldthwait	Boone	Boone	Iowa.
Charles Lonsdale	Dale City	Guthrie	Do.
S. Cary	Saratoga	Winona	Minnesota.
S. H. Rouit	Rural Vale	Whitfield	Georgia.
James E. McNair	Webb City	Jasper	Missouri.
Benjamin Hunt	Eatonton	Putnam	Georgia.
S. S. Lindler	Pine Ridge	Lexington	South Carolina.
Link Sanders	Honey Creek	Henry	Indiana.
Dr. H. C. Mathis	Taylorsville	Spencer	Kentucky.
J. W. Livington	Seneca	Oconee	South Carolina.
Rev. C. Foster Williams	Hoffman	Maury	Tennessee.
Preston J. Clarke	Rockpile	Dawson	Georgia.
C. H. Andrew	Fort Lamar	Madison	Do.
J. P. Bain	Texas City	Saline	Illinois.
J. L. Wilson	Bairdstown	Oglethorpe	Georgia.
Mrs. M. B. McConnell	Black Mingo	Williamsburg	South Carolina.
Dr. P. H. Mayo	Falkland	Pitt	North Carolina.
F. B. Sawvel	Canfield	Mahoning	Ohio.
T. B. Nees	Hartford	Lyon	Kansas.
B. A. Blakely	Auburn	Gwinnett	Georgia.
D. R. Feaster	Feasterville	Fairfield	South Carolina.
J. A. Walther	Winton	Hertford	North Carolina.
A. B. Grover	Mitchell	Robertson	Tennessee.
Joseph M. Graham	Skye	Richmond	North Carolina.
Elias Casper	Cobb	Shelby	Alabama.
John W. Jones	Coral Hill	Barren	Kentucky.
G. W. P. Carr	Tazewell	Marion	Georgia.
Albert P. Leisser	Browns	Dallas	Alabama.
W. H. D. Brown	Reid	Greenville	South Carolina.
John Reynolds	Mayfield	Hancock	Georgia.
Thomas R. Davis	Price's Mill	Union	North Carolina.
Richard C. Young	Winchester	Jefferson	Kansas.
Lewis Lowe	Pleasant Mound	Montgomery	Tennessee.
S. W. Terrell	Polesville	Wake	North Carolina.
W. C. McBrayer	Draketown	Haralson	Georgia.
Hon. W. H. McClure	Hayesville	Clay	North Carolina.
Dr. J. M. Lyle	Franklin	Macon	Do.
N. G. Phillips	Robbinsville	Graham	Do.
D. A. Collins	Charleston	Swayne	Do.
Hon. James W. Terrill	Webster	Jackson	Do.
Hon. M. C. King	Murphy	Cherokee	Do.
Capt. C. H. Messinger	Asheville	Buncombe	Do.
Prof. J. A. Davis	Watalula	Franklin	Arkansas.
T. H. Rankin	Berry	Harrison	Kentucky.
J. W. Gifford	Dansville	Ingham	Michigan.
J. F. Smith	Cedar Grove	Walker	Georgia.
Matt. T. Baptiste	West Point	Clay	Mississippi.
T. W. Florer	Waxahachie	Ellis	Texas.
Arthur Dransfield	New Harmony	Posey	Indiana.
John F. Cotton	Flaggtown	Montgomery	North Carolina.
J. M. Anderson	Cowan	Delaware	Indiana.
A. H. Harlan	New Burlington	Clinton	Ohio.
Dr. A. C. Halbert	Cobb Switch	Lowndes	Mississippi.
A. H. Peffly	Arcanum	Darke	Ohio.
Dr. R. M. Cotton	Tyndall	Bon Homme	Dakota.
George B. Bard	Symco	Waupaca	Wisconsin.
Frank Pease	Silver City	Montgomery	Arkansas.
P. C. Bluhm	Smithville	De Kalb	Tennessee.
C. C. Gossett	Cain's Store	Pulaski	Kentucky.
A. B. Etienne	Centreville	Saint Mary's	Louisiana.
J. B. Herndon	Keysburgh	Logan	Kentucky.
Allen White	Houston	Chickasaw	Mississippi.
D. B. White	Snow Creek	Iredeli	North Carolina.
J. H. Roark	Marion	Union	Louisiana.
M. M. Moulton	Webster	do	Dakota.
A. W. Hawkins	Huntingdon	Carroll	Tennessee.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
John G. Edwards	Edward	Franklin	Ohio.
John Merkle	Reno	Houston	Minnesota.
John Blume	Marathon	Marathon	Wisconsin.
Hon. A. B. Greenwood	Bentonville	Benton	Arkansas.
J. R. Plyler	Plyler's	Lancaster	South Carolina.
G. G. Hughes	Burlington	Boone	Kentucky.
Eli Stewart	Stewart's Mill	Schley	Georgia.
J. S. Durham,	Double Shoal	Cleveland	North Carolina.
W. R. Capehart	Avoca	Bertie	Do.
W. H. Cook	Saddlersville	Robertson	Tennessee.
Miss Jane P. Jones	Jones Creek	Anson	North Carolina.
Dr. L. J. Thomas	York	Houston	Georgia.
D. Bienvenu, jr	Labadieville	Assumption	Louisiana.
Robt. J. Jewell	Elk Creek	Spencer	Kentucky.
John F. Webster	Rutland	Harrison	Do.
L. A. Lavender	Mantua	Greene	Alabama.
Newel Thurston	Hope	Dickinson	Kansas.
V. M. Howard	Deerfield	Franklin	Massachusetts.
Sarah E. W. Winslow	Science Hill	Randolph	North Carolina.
Geo. H. Dunn	Greensburgh	Decatur	Indiana.
Dr. W. F. Brooker	Pine Plains	Lexington	South Carolina.
Ben. R. Berry	Brooksville	Blount	Alabama.
Levi T. Branson	White House	Randolph	North Carolina.
E. B. Proctor	Lumberton	Robeson	Do.
J. L. Coleman	Lineburgh	Pickens	Alabama.
W. C. McMurray	Farmer City	De Witt	Illinois.
John F. Holden	Crawfordville	Taliaferro	Georgia.
Mont Robinson	Fairmont	Vermillion	Louisiana.
Mrs. Isaac Sessums	Sessumsville	Oktibbeha	Mississippi.
Thomas G. Scott	Forsyth	Monroe	Georgia.
James L. Newhouse	Reed's Station	Delaware	Indiana.
H. B. Blakely	Scuffletown	Laurens	South Carolina.
Judge B. P. Harran	Arlington	Reno	Kansas.
W. J. Rice	Liberty	Pickens	South Carolina.
Calvin Hardison	Hardison's Mills	Maury	Tennessee.
J. K. Neal	Neal	Pickett	Do.
George L. Hays	Marshall	Saline	Missouri.
M. C. Wilcox	Mount Airy	Habersham	Georgia.
A. W. Stokes	Newnan	Coweta	Do.
Jas. B. Hunnicutt	Turin	Coweta	Do.
W. A. Austin	Gibralter	Union	North Carolina.
J. Hunsucker	Conover	Catawba	Do.
William Miller	Union	Green	Alabama.
R. L. McNabb	Ooltewah	James	Tennessee.
W. A. Morton	Abilene	Dickinson	Kansas.
D. A. Speer	Varnell's Station	Whitfield	Georgia.
John M. Smith	Skelton	Jefferson	Alabama.
Henry C. Long	Waverly	Clay	Mississippi.
Ira C. Dickerson	Lawley	Shelby	Alabama.
W. P. Bradford	Danburgh	Wilkes	Georgia.
W. P. Stearns	Stearnsville	Pike	Do.
Josiah Buscton	Shaker	Warren	Ohio.
W. B. Johnson	Moore's Creek	Jackson	Kentucky.
J. M. Scott	Montpelier	Clay	Mississippi.
O. B. Jenks	North Brook	Lincoln	North Carolina.
N. L. Willet	Augusta	Richmond	Georgia.
F. D. Parmelee	Hillsdale	Hillsdale	Michigan.
Daniel Faulkner	Poston	Ripley	Indiana.
J. C. Hunter	Goshen Hill	Union	South Carolina.
Dr. V. S. McNider	Jackson	Northampton	North Carolina.
J. M. Myers	Belton	Hall	Georgia.
J. H. Tabor	Bankston	Choctaw	Mississippi.
George W. Turner	Lillington	Harnett	North Carolina.
B. L. Blackmore	Warsaw	Duplin	Do.
Dr. E. C. Cochran	Tunnel Hill	Whitfield	Georgia.
J. R. Widby	Lenoir	Caldwell	North Carolina.
James A. Evans	Scottville	Macoupin	Illinois.
Rev. William E. Kimball	Madison	Madison	Nebraska.
J. P. Atkins	Pittsburg Landing	Hardin	Tennessee.
John R. Gill	Wilson	Winona	Tennessee.
Dr. James P. Owen	Point Peter	Searcy	Arkansas.
H. F. Shaner	Troy	Doniphan	Kansas.
E. B. Sankey	Salem	Dent	Missouri.
J. G. Orton	Binghamton	Broome	New York.
D. W. Brailsford	Panola	Clarendon	North Carolina.
Mary C. Jameson	Geneva	Talbott	Georgia.
W. H. Dunkin	Hutchinson	Reno	Kansas.
W. F. White	Ford's Store	Hart	Georgia.
C. E. Webster	Almond	Portage	Wisconsin.
T. C. Osborn	Cleburne	Johnson	Texas.
Stephen Crosby	Meador	Union	South Carolina.
Daniel Stone	Cincinnati		Ohio.
William H. Hanckell	Abbeville	Abbeville	South Carolina.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
H. D. Pearce	Runnels	Runnels	Texas.
W. J. Davisson	Farmland	Randolph	Indiana.
A. Hoffman	Hartley	Montgomery	Texas.
H. F. Stringfellow	Deep Spring	Cheatham	Tennessee.
J. H. Wood	Cedar Plains	Morgan	Alabama.
L. D. Walrad	Mount Ida	Anderson	Kansas.
C. Bouseman	Saratoga	Randolph	Indiana.
Helen F. Halloway	Winslow	Harnett	North Carolina.
Thomas Marrow	Hartsell	Morgan	Alabama.
H. J. Raysdale	Urena	Banks	Georgia.
R. S. McMahon	Chacahoula	Terre Bonne	Louisiana.
J. H. Williams	Fordland	Webster	Missouri.
R. B. Olmstead	Milan	Rock Island	Illinois.
Charles P. Hillan	Centreville	Montgomery	Ohio.
David Evans	Macedonia	Franklin	Indiana.
C. R. Baugh	Mershan's Cross R'ds	Laurel	Kentucky.
John McCullough	Hillsborough	Jasper	Georgia.
M. E. Stewart	Clanton	Chilton	Alabama.
H. Keneghan	Brandon	Rankin	Mississippi.
J. C. Hutchison	Monmouth	Warren	Illinois.
Sallie Dillon	Little Rock	Marion	South Carolina.
T. J. Maxwell	Saint John	Stafford	Kansas.
H. J. Yarborough	Guernsey	Hempstead	Arkansas.
S. N. Russell	Blairsville	York	South Carolina.
G. H. Slaughter	Saint Bethlehem	Montgomery	Tennessee.
G. W. Templeton	Mooresville	Iredell	North Carolina.
J. H. Gouger	Davidson College	Mecklenburgh	Do.
William M. Towers	Rome	Floyd	Georgia.
L. M. Wainwright	Noblesville	Hamilton	Indiana.
I. N. Beckner	Whitesburgh	Hamblem	Tennessee.
R. S. Allen	Tyra	Moore	North Carolina.
W. C. Rollins	Rome	Williamsburgh	South Carolina.
Hosea Hale	Love's Level	Union	North Carolina.
George Allen	Poland	Mahoning	Ohio.
Iva A. Fitzgerald	Linwood	Davidson	North Carolina.
William A. Black	Americus	Sumpter	Georgia.
N. L. Willet	Augusta	Richmond	Do.
A. E. Sprague	Briee	Franklin	Ohio.
M. L. Lamaster	Pinkney	Union	South Carolina.
William Wine	Rockford	Blount	Tennessee.
S. B. Garrett	Daleville	Delaware	Indiana.
W. A. Austin	Gibralter	Union	North Carolina.
Dr. P. D. Robertson	Lima	Carroll	Missouri.
W. L. Belk	Big Springs	Clay	Mississippi.
W. J. Dennis	Indiantown	Williamsburgh	South Carolina.
J. A. Hartzler	Mottville	Saint Joseph	Michigan.
R. Tusner	Wellford	Spartanburgh	South Carolina.
J. B. Alexander	Duck Creek	Dallas	Texas.
John L. Bardin	Effingham Station	Marian	South Carolina.
Dr. A. R. Kilpatrick	Navasota	Grimes	Texas.
Peter Hulling	Parker	Montgomery	Kansas.
W. L. Gilbert	Elmwood	Iredell	North Carolina.
J. B. Anderson	Waterloo	Laurens	South Carolina.
Ed. Zumbro	Browning	Linn	Missouri.
A. W. Wilcox	Le Mars	Plymouth	Iowa.
William H. Bonner	Calhoun	Gordon	Georgia.
J. W. Clopton	Lamar	Sumter	Do.
J. T. Thompson	Lilly Pond	Gordon	Do.
E. J. Simmons	Courtland	Lawrence	Alabama.
G. F. Arnick	Scipio	Jennings	Indiana.
James M. Johnson	Hoover Hill	Randolph	North Carolina.
C. C. White	High Point	Guilford	Do.
John G. Kay	Ithaca	Darke	Ohio.
F. A. O. Angle	Dandridge	Jefferson	Tennessee.
John Christine	Waymansville	Bartholomew	Indiana.
Prof. J. Allen Holt	Oak Ridge	Guilford	North Carolina.
S. F. Hardy	Markleville	Madison	Indiana.
Samuel Pruitt	Polk Bayou	Sharp	Arkansas.
D. H. Bagley	Beulah	Johnston	North Carolina.
H. P. Daviss	Fairfield	Freestone	Texas.
H. C. Hogg	Booneville	Owsly	Kentucky.
J. N. Mangum	Pine Tree	Chesterfield	South Carolina.
J. W. Renfro	Howth Station	Waller	Texas.
P. Bryan, jr	Leesdale	Morgan	Alabama.
J. M. Hough	Old Store	Chesterfield	South Carolina.
Henry Baxter	Galen	Warren	Pennsylvania.
N. J. Proctor	O'Kean	Randolph	Arkansas.
G. W. Brooks	Ellsworth	Mahoning	Ohio.
T. Collins	Choestoe	Union	Georgia.
Thomas L. Reid	Robertson	Clay	Mississippi.
J. S. Britt	Wideman's	Abbeville	South Carolina.
Dr. George C. McNeill	Catawba	Catawba	North Carolina.
Warren F. Woodliff	Brown's Bridge	Forsyth	Georgia.

List of tornados reported, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
David Burris	Big Lick	Stanley.	North Carolina.
G. R. Philips	Chickamauga	Hamilton	Tennessee.
L. A. Elster	Jeffersonville	Fayette	Ohio
T. C, Sexton,	Burnt Factory	Spartanburg	South Carolina.
W. L. Springfield	Bellville	Austin	Texas.
C. I. Holland	Holland's Store	Chatooga	Georgia.
J. A. D. Stephenson	Statesville	Iredell	North Carolina.
Samuel Buchanan	Welda	Anderson	Kansas.
John G. Detwiler	New Smyrna	Volusia	Florida.
W. O. Kidder	Youngstown	Warren	Illinois.
W. C. Dunn	Simpson's Mills.	Laurens	South Carolina.
V. M. Lahman	Wiota	Cass	Iowa.
W. M. Stringer	Stringer	Morgan	Alabama.
C. G. Campbell	Greenvine	Washington	Texas.
M. B. Clark	Haskell	Anderson	Kansas.
John T. M. Haire	Lexington	Oglethorpe	Georgia.
M. D. Watson	Line Creek	Webster	Mississippi.
H. J. Slarnes	Mount Prospect	Union	North Carolina,
J. W. Hackworth	Brenham	Washington	Texas.
William L. Jones	Atlanta	Fulton	Georgia.
E. R. Steele	Neodesha	Wilson	Kansas.
Morgan Blair	Cedar Valley	Caldwell	North Carolina.
John D. Johnson	State Road	Surrey	Do.
C. H. Longstreth	Lakin	Finney	Kansas.
W. R. Hambrick	Leasburg	Caswell	North Carolina.
T. W. Smith	O'Neal's Mills	Troup	Georgia.
George F. Houscr	Ellinwood	Barton	Kansas.
G. A. Kelley, M. D	Burns	Marion	Do.
W. H. Knight	Kimeo	Washington	Do.
E. W. Russey	Bowie	Montague	Texas.
Eugene Honerton	Solomon City	Dickinson	Kansas.
J. F. Boyd	Personville	Limestone	Texas.
J. J. Jones	Milton	Caswell	North Carolina.
W. W. McCracken	Beloit	Mitchell	Kansas.
N. B. Snapp	Winslow	De Kalb	Missouri.
Mrs. J. N. Holland	Anderson	Webster	Mississippi.
W. W. Abercrombie	Saltville	Mitchell	Kansas.
Samuel Huffman	Matanzas	Chautauqua	Do.
J. A. Corpening	Mill River	Henderson	North Carolina.
L. E. Vermillion	Prosper	Rice	Kansas.
J. T. Steward	Steward's Mill	Freestone	Texas.
W. N. Hall	Smith Centre	Smith	Kansas.
R. B. Johnson	Chapel Hill	Washington	Texas.
W. H. Wilcox	Wilcox	Trego	Kansas.
W. P. Davis	Sunny Side.	Waller	Texas.
Thomas Bradford	Centre	Cherokee	Alabama.
J. E. Thompson	Mount Hersey	Newton	Arkansas.
Charles A. Wyman	Hutchinson	McLeod	Mineesota.
E. E. Middleton	Woolstock	Wright	Iowa.
J. A. Fawlkes	Delphi	Alleghany	North Carolina.
W. E. Logan	Grantville	Buncombe	Do.
Mrs. E. J. Bennett	Cashiers	Jackson	Do.
C. J. Trafton	Haymond	Presidio	Texas.
J. C. G. Smith	Fredonia	Wilson	Kansas.
J. W. Seaman	Loveland	Larimer	Colorado.
W. B. Pearson	Gere	Barton	Kansas.
George Wright	Dighton	Lane	Do.
Nathan Potter	Paris	Lincoln	Do.
Eli Newsom	Spring Valley	Mitchell	Texas.
A. L. Hannaford	Lehigh	Marion	Kansas.
Julia Emmons	Cutts	Lane	Do.
J. E. Shaw	Mulvane	Sumner	Do.
Frank B. Hancock	Casky	Christian	Kentucky.
Ed Atkin	Fremont	Graham	Kansas.
C. W. Crampton	Osborne	Osborne	Do.
F. W. Hopkins	Greenbrier	Limestone	Alabama.
C. W. McReynolds	Nepesta	Pueblo	Colorado.
R. R. Wilkinson	Weston.	Dunn	Wisconsin.
Henry Horn	Marshall	Searcy	Arkansas.
J. J. Larrise	Mecklenburgh	Schuyler	New York.
J. K. Wise	Blairstown	Benton	Iowa.
J. A. Keeler	Eagle Bapids.	Smith	Kansas.
Richard Owen	New Harmony	Posey	Indiana.
E. L. Dunham	Greeley	Weld	Colorado.
Fred W. Wayner	Germantown	Smith	Kansas.
J. M. Fowler	Cashville	Spartanburg	South Carolina.
George W. Smith	Bennet	Arrapahoe	Colorado.
Thomas Davies	Abilene	Taylor	Texas.
J. P. Marshall	Black Hawk	Carroll	Mississippi.
Gustav Bastian	Welcome	Austin	Texas.
A. M. Mulford	New Providence	Hardin	Iowa.
P. M. Ford	Cross Plains	Robertson	Tennessee.
L. M. Bragg	Courtney	Grimes	Texas.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
William R. Allen	Jackson	Pueblo	Colorado.
Frank Bascom	Upland	Jowell	Kansas.
A. H. Morris	Rush Centre	Rush	Do.
E. N. Gilbert	Steele City	Jefferson	Nebraska.
C. D. Wheelock	Allison	Decatur.	Kansas.
W. G. Sidwell	Hutton	Rush	Do.
D. B. Painter	Hutton	Rhea	Tennessee.
J. G. Henslee	McEwen	Humphreys	Do.
Pinckney Hawkins	Anderson	Grimes	Texas.
George W. DeLong	Saxon	Saline	Nebraska.
John Stibal	Richland	Colfax	Do.
J. W. Kyle	Collyer	Trego	Kansas.
W. S. Dilworth	Crab Orchard	Johnson	Nebraska.
Ed. F. Brown	La Crosse	Rush	Kansas.
J. S. Bowlby	Cañon City	Fremont	Colorado
L. F. Davis	Athens	Jewell	Kansas.
E. B. Gatchell.	Leona	Doniphan	Do.
William H. Snyder	Tapley	Osborne	Do.
C. P. Blachly	Manhattan	Riley	Do.
A. L. Sparger	Mount Airy	Surry	North Carolina.
W. J. Mossholder	Oceola	Polk	Nebraska.
Isaac N. Chinowth	Eighty Eight	Barren	Kentucky.
E. Whitcomb	Friend,	Saline	Nebraska.
Sarah Stuart	Wolf Creek	Cherokee	North Carolina.
Q. C. Sasser	Faisin	Duplin	Do.
Joel Hull	Winden	Kearney	Nebraska.
A. G. Eberhart	Andalusia	Rock Island	Illinois.
Joshua Taylor	White Cloud	Doniphan	Kansas.
R. B. Knock	Havana	Montgomery	Do.
W. H. Timberlake	Columbus	Cherokee	Do.
John G. Holston	Soldier	Jackson	Do.
Almon Stuart	Zyba	Kearney	Nebraska.
George Shedd	Ashland	Sauders	Do.
W. E. W. Bailey	Lapland	Greenwood	Kansas.
John L. Mitch	Catlin	Bent	Colorado.
S. G. Graham	Catlin	do	Do.
Isham Cox	Liberty	Randolph	North Carolina.
Agnes Kinnear	Standardt	Iowa	Wisconsin.
E. R. Ewell	Bird Nest	Pawnee	Kansas.
E. N. Eubanks	Hawthorne	Aiken	South Carolina.
G. W. Norman	Apishapa	Los Animas	Colorada.
V. S. Runnels	Runelsburg	Hall	Nebraska.
A. Knievel	Clearwater	Antelope	Do.
John James	James Crossing	Jackson	Kansas.
V. Van Trump	Belleville.	Republic	Do.
E. B. McNitt	Red Cloud	Webster	Nebraska.
R. Phillips	La Junta	Bent	Colorado.
Ira N. Lyman	Saint Peter.	Cedar	Nebraska.
Charles Ruff	Hodgeman	Hodgeman	Kansas.
J. H. Milhouse	Jewell	Dawson	Nebraska.
C. Fountain	Millbrook	Graham	Kansas.
W. D. Cox	Ulysses	Butler	Nebraska.
Edward Trow	Minneapolis	Ottawa	Kansas.
E. J. Brethowder	Holland	Lancaster	Nebraska.
Ed. Gilford	Cowles	Webster	Do.
E. A. Sayre	Himrod's	Yates	New York.
Samuel E. Hardy	East Norway	Doniphan	Kansas.
C. P. Woodworth	Lodi	Seneca	New York.
C. H. Heald	Mill Creek	Chichasaw Nation	Indian Territory.
John C. Mallory	Savona	Steuben	New York.
A. V. Butterfield	Eleven Mile	Potter	Pennsylvania.
E. R. Rogers	Corning	Steuben	New York.
J. M. McClain	Catlin	Bent	Colorado.
John Shoff	Grafton	Fillmore	Nebraska.
E. D. Burgess	Breesport	Chemung	New York.
B. F. Reagan	Raymond	Lancaster	Nebraska.
A. D. Swallow	Sterling	Johnson	Do.
William T. Lewis	Louisville	Winston	Mississippi.
Eddie Lewis	Worthing	Lincoln	Dakota.
T. N. Hartzell	Kearney	Buffalo	Nebraska.
Isaac E. Heaton	Fremont	Dodge	Do.
Solomon Cain	Wilcox	Nodaway	Missouri.
A. M. Pierce	Byrdstown	Pickett	Tennessee.
Harrison Russell	Big Creek	Steuben	New York.
C. H. Sharpe	Friendship	Allegany	Do.
W. T. Chapman	Ponca	Dixon	Nebraska.
E. F. Hutchinson	Bellwood	Bulter	Do.
Thomas A. Sawyer	Campbell	Steuben	New York.
Samuel D. I. Emerson	Milford	Seward	Nebraska.
G. W. Swick	Rocky Ford	Bent	Colorado.
G. H. Ransom	Bancroft	Cuming	Nebraska.
R. McHutcheon	White Rock	Republic	Kansas.
C. F. Purdy	Purdyville	Hodgeman	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
N. B. S. Odell	Fullerton	Nance	Nebraska.
A. C. Folsom	Dell Rapids	Minnehaha	Dakota.
C. D. Harris	Ovid	Seneca	New York.
Almedia L. Young	Branchport	Yates	Do.
S. A. Hebrew	Rockport	Rooks	Kansas.
J. Edward Wiley	Waverly	Morgan	Indiana.
G. S. Bishop	Indianola	Redwillow	Nebraska.
Peter Saispair	Swaburg	Dodge	Do.
Charles Shieldstream	Central City	Merrick	Do.
P. F. Peterson	Tekamah	Burt	Do.
Sarah D. Anderman	Creston	Platte	Do.
Clyde C. Way	Kendall Creek	McKean	Pennsylvania.
J. Farwell	Phillips Creek	Allegany	New York.
Etta Francis	Runnymede	Harper	Kansas.
A. Scheuber	Erfurt	Jefferson	Wisconsin.
P. S. Howell	Brett	Norton	Kansas.
D. L. Tallmadge	Cambridge	Furnas	Nebraska.
P. ABryant	Sonora	Steuben	New York.
S. Bredelman	Doniphan	Hall	Nebraska.
J. B. Nugent	Sherwood	Calumet	Do.
A. Morell	Oakland	Burt	Do.
E. P. Barber	Syracuse	Hamilton	Kansas.
Abner C. Wright	Wellsburg	Chemung	New York.
W. J. Crane	Arlington	Washington	Nebraska.
George D. Carrington	Brownsville	Nemaha	Do.
A. J. Barnes	Millport	Potter	Pennsylvania.
R. D. Winn	Lawrenceville	Gwinnet	Georgia.
H. Mower, M. D.	Saint Marys	Pottawottamie	Kansas.
C. F. Carr	Clarence	Barton	Do.
N. T. Moulton	Cedar Rapids	Boone	Nebraska.
George C. Silsbee	Avoca	Steuben	New York.
Lott Reynor	Arkport	do	Do.
J. B. Lewis	Thornton	Polk	Nebraska.
James E. Blair	Elkpoint	Union	Dakota.
E. Bartholomew	Rockport	Rooks	Kansas.
Thomas D. McCague	Garnet	Anderson	Do.
C. H. Goddard	Swan Lake	Turner	Dakota.
L. Case	Knoxville	Tioga	Pennsylvania.
D. E. James	Richland Centre	Richland	Wisconsin.
Michael Griffin	Springfield	Bon Homme	Dakota.
M. A. Butterfield	Montrose	McCook	Do.
J. W. McReynolds	Tower Spring	Lincoln	Kansas.
Andrew Johnson, jr	Bega	Stanton	Nebraska.
D. R. Callahan	Stockville	Frontier	Do.
W. H. Hubbard	Fairview	Lincoln	Dakota.
E. Bisbee	West Branch	Potter	Pennsylvania.
E. G. Bruner	West Point	Cuming	Nebraska.
John L. Hunt	Villanow	Walker	Georgia.
C. Q. De France	Kesterson	Jefferson	Nebraska.
James B. Wright	Zenith	Reno	Kansas.
Thomas G. Hull	Brookland	Potter	Pennsylvania.
Max Monvoison	Max	Dundy	Nebraska.
C. P. Wetzell	Stockville	Frontier	Do.
Nathan Campbell	Kearney	Buffalo	Do.
C. J. Fox	La Grange	Yankton	Dakota.
E. Miller	Lawrence	Douglas	Kansas.
Artemus Walters	Ula	Custer	Colorado.
M. Ryan	Jefferson	Union	Dakota.
Peter Ring	Big Spring	do	Do.
Benj. C. Rich	Ellis	Ellis	Kansas.
A. C. Tyrrell	Madison	Madison	Nebraska.
E. D. Parsons	Indian Creek	York	Do.
F. D. Hulbert, M. D	Loganville	Sauk	Wisconsin.
I. B. Wiley	Wileysville	Steuben	New York.
A. G. Garrett	Ward	Overton	Tennessee.
R. S. Gaylord	Riverside	Clay	Dakota.
Mrs. M. E. Ellis	Gothland	Union	Do.
Thomas Maher	Emmett	do	Do.
Will M. Cravin	Armada	Buffalo	Nebraska.
Erastus Smith	Beaver Creek	do	Do.
Frank S. Gay	Red Wing	Nance	Do.
T. O. Tucker	Saint Francis	Clay	Arkansas.
C. W. Gray	Jordan Springs	Reno	Kansas.
Elizabeth Ingalls	Long Creek	Lincoln	Dakota.
W. G. Daugherty	Eagle	Cass	Nebraska.
William A. Eddy	133 E. Sixteenth street New York City.	New York	New York.
G. B. Nichols	Martin	Allegan	Michigan.
G. W. Moore	Cloverland	Clay	Indiana.
Frank Fuller	Wayne	Wayne	Nebraska.
Josiah Cusick	Nelson	Vigo	Indiana.
John W. McGinnis	Ashborough	Clay	Do.
M. M. Jones	Flandreau	Moody	Dakota.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
O. R. Gaskill	White Oak	Mahaski	Iowa.
Miss Ara C. G. Williams	Rescue	Saunders	Nebraska.
W. W. Craddock	Knoxville	Marion	Iowa.
L. S. Rouse	Belle Plain	Shawano	Wisconsin.
E. Roberts	Hall's Summit	Coffey	Kansas.
H. L. Williams	Lineburg	Pickens	Alabama.
J. E. Shultz	Arborville	York	Nebraska.
I. F. Cox	La Grange	Troup	Georgia.
J. E. W. Haile	Flat Rock	Kershaw	South Carolina.
Thos Owen	Owenville	Sampson	North Carolina.
Jane Harris	do	do	Do.
Marx F. Wistrom	Harvard	Clay	Nebraska.
George A. Teel	Seaton	Hamilton	Do.
G. M. Dodge	Glencoe	Dodge	Do.
Albert Armes	Kendall	Van Buren	Michigan.
Timothy Church	Cheshire	Allegan	Do.
R. Lamkins	Dodge	Trempealeau	Wisconsin.
D. C. Godfrey	Plato	Saline	Nebraska.
D. M. Camp	Ben Wade	Pawnee	Kansas.
W. E. Curtis	Brown's Grove	do	Do.
E. Royce	Palisade	Minnehaha	Dakota.
H. D. Stockman	Woodville	Saint Croix	Wisconsin.
F. N. Robinson	Howard	Miner	Dakota.
Reuben F. Little	Richardson	Polk	Wisconsin.
I. H. Ross	Leeds	Jefferson	Alabama.
Julius Peterson	Rice Lake	Barron	Wisconsin.
E. G. Butts	Stillwater	Washington	Minnesota.
Joseph Streiff	Oakdale	do	Do.
W. H. Wood	Brookville	Saint Croix	Wisconsin.
C. J. White	New Centreville	do	Do.
Mrs. J. Klingensmith	Orangeville Mills	Barry	Michigan.
Craig W. Green	Elmira	Chemung	New York.
J. Q. Mahaffey	Lickville	Greenville	South Carolina.
S. P. Chase	Brookfield	Tioga	Pennsylvania.
A. J. Owen	Fall Brook	do	Do.
Stephen Rowcliffe	Osceola Mills	Polk	Wisconsin.
H. P. Gatchell	Asheville	Buncombe	North Carolina.
D. A. Robertson	Saint Paul	Ramsey	Minnesota.
Merrick Kendall	Kendall Station	Chemung	New York.
J. W. Van Vleit	Wilson	Saint Croix	Wisconsin.
Mrs. J. B. Edsall	Altus	Bradford	Pennsylvania.
George Healy	Rochester	Olmstead	Minnesota.
Charles S. Barney	West Union	Steuben	New York.
S. F. Riggs	Granville Summit	Bradford	Pennsylvania.
John Siskron	Darlington	Darlington	South Carolina.
L. C. Floyd	Alvin	Hamilton	Nebraska.
Samuel H. Fry	Aurora	do	Do.
D. K. Marsh	Marshfield	Tioga	Pennsylvania.
Alfred S. Brown	Wellsville	Allegany	New York.
G. E. Culver	Vermillion	Clay	Dakota.
F. A. Carlson	Apple River	Polk	Wisconsin.
William K. King	Ceres	Allegany	New York.
A. T. James	Blossburgh	Tioga	Pennsylvania.
D. P. Haight	Mountain Lake	Bradford	Do.
Gustave A. Grant	Highland	Minnehaha	Dakota.
J. N. Sheldon	Scio	Allegany	New York.
George H. Webb	Alba	Bradford	Pennsylvania.
Hiram O. Chapin	White's Corners	Potter	Do.
W. T. Daly	Leona	Bradford	Do.
W. H. Hudson	Larabee	McKean	Do.
George P. Anderson	Bunyan	Polk	Wisconsin.
George Richardson	Bloomingdale	Clay	Dakota.
P. L. Burlingame	Van Ettenville	Chemung	New York.
P. A. Greeley	Stinson	Outagamie	Wisconsin.
William J. Raysdill	Saint Charles	Butler	Ohio.
F. H. Rasmussen	El Salem	Polk	Wisconsin.
W. S. Foster	Ladora	Iowa	Iowa.
Harris Taylor	Bazette	Navarro	Texas.
George G McWhorter	Milton	Santa Rosa	Florida.
J. W. Mulliken	Dudley	Fillmore	Nebraska.
W. L. Harvey	Clifton	Lackawanna	Pennsylvania.
B. M. Hall	South Eaton	Wyoming	Do.
George W. Cooke	Beaumont	do	Do.
E. J. Drum	Gouldsborough	Lackawanna	Do.
S. B. Hills	Green Grove	do	Do.
E. A. Stevens	Hollisterville	Wayne	Do.
Edward Himrod	Dunmore	Lackawanna	Do.
Thomas Johnston	Milwaukee	do	Do.
R. A. Whiteman	Lehman	Luzerne	Do.
Perry A. Clark	Cherry Ridge	Wayne	Do.
John Bryant	Elk City	Douglas	Nebraska.
F. B. Hodge	Wilkesbarre	Luzerne	Pennsylvania.
T. B. Orchard	Hamlinton	Wayne	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
W. F. Young	Littleton	Halifax	Pennsylvania.
H. S. Freas	Wapwallopen	Luzerne	Do.
C. S. Fargo	Wanomie	do	Do.
Charles Ekdohl	Scandia	Washington	Minnesota.
A. C. Sisson	La Plume	Lackawanna	Pennsylvania.
William Thompson	Centremoreland	Wyoming	Do.
Henry Ernst	Bellasylva	do	Do.
W. S. Jones	Slocum	Luzerne	Do.
Theodore Day	Dyberry	Wayne	Do.
G. W. Wiedman	Amasa	Lackawanna	Do.
Charles H. Hall	Dallas	Luzerne	Do.
J. F. Wilber	Peckville	Lackawanna	Do.
George A. Silsby	Mitchell	Davison	Dakota.
A. F. Williams	Goodle	Beadle	Do.
B. J. Cannon	Drinkers	Lackawanna	Pennsylvania.
D. Stewart	Home	Turner	Dakota.
R. M. Dexter	Canova	Miner	Do.
Casper Oberdorfer	Harding	Luzerne	Pennsylvania.
George H. Fassin	Edgard	Saint John Baptist	Louisiana.
C. V. More	Winterdale	Wayne	Pennsylvania.
Albert Martin	Adelia	Turner	Dakota.
S. J. Cornell	De Witt	Sanborn	Do.
Edwin Miller	Grant City	Sac	Iowa.
James R. Van Buren	Griswoldville	Jones	Georgia.
J. W. A. Wright	Greensborough	Hale	Alabama.
E. Sawyer	Sawyerville	do	Do.
Henry A. Taylor	Gallion	do	Do.
W. E. Moor	Bridgetown	Shelby	Do.
C. P. Luttrell	Pearson	Fayette	Ohio
Dana Rhodes	Groton	Tompkins	New York.
David W. Lester	Haddock Station	Jones	Georgia.
Otis Scovall	New Helena	Custer	Nebraska.
John F. Vardaman	Kellyton	Coosa	Alabama.
E. J. Blackburn	Ironville	Perry	Do.
J. R. Baxter	Lebanon	De Kalb	Do.
L. Grovitt Rhodentown	Rhodentown	do	Do.
B. C. Willis	Burton's Hill	Greene	Do.
J. S. Hansberger	Tionus	Bibb	Do.
James F. Bailey	Marion	Perry	Do.
A. C. Copeland	Crossville	De Kalb	Do.
J. J. Parish	Adell	Berrien	Georgia.
J. J. Lee	Sand Tuck	Ellmore	Alabama.
James M. McCullough	Felix	Perry	Do.
George W. Duncan	Franklin	Simpson	Kentucky.
D. R. Antry	Dismal	Sampson	North Carolina.
G. M. Ellis	Emmetsburgh	Palo Alto	Iowa.
Thomas J. Crumley	Crossville	De Kalb	Alabama.
Alex. Gaddies	Emmetsburgh	Palo Alto	Iowa.
J. A. Yeager	Pondville	Bibb	Alabama.
W. H. Reynolds	Packsville	Clarendon	South Carolina.
R. B. Pruett	Mount Olive	Coosa	Alabama.
J. P. Harris	Harrisburgh	Bibb	Do.
George C. Mosher	1636 Summit street, Kansas City.		Missouri.
W. L. Brown	Van Alstyne	Grayson	Texas.
E. Pasome	Dallas	Gaston	North Carolina.
Ed. A. Killian	Leavenworth	Leavenworth	Kansas.
B. F. Steedman	Collinsville	Grayson	Texas.
D. Krebs	Kingston	Hunt	Do.
George H. Groves	Melissa	Collins	Do.
W. F. Felty	Hickory Creek	Fannin	Do.
Dan Van Trump	Norborne	Carrol	Missouri.
A. C. Carnes	Weston	Collin	Texas.
T. B. McCracken	Zion	Lowndes	Mississippi.
Simon Daw	Malta Bend	Saline	Missouri.
A. G. Lackey	Marshall	do	Do.
M. M. Yeakley	Mountain Spring	Cooke	Texas.
A. E. Baum	Bolivar	Denton	Do.
R. M. Orrell	Fayetteville	Cumberland	North Carolina.
J. W. Andrews	Laurinburgh	Richmond	Do.
G. E. Reeves	Pottsborough	Grayson	Texas.
A. M. Armstrong	Crawford	McLennan	Do.
W. G. Laffender	Sioux Falls	Minnehaha	Dakota.
F. M. Makeig	Waco	McLennan	Texas.
M. Yoakum	Tehuacana	Limestone	Do.
J. I. Adams	Eatonton	Putnam	Georgia.
H. S. Austin	Plevna	Reno	Kansas.
Charles Schaefer	Lorena	McLennan	Texas.
H. F. Fowler	Basin Springs	Grayson	Do.
W. A. Rexroat	Elmont	do	Do.
L. F. McMillan	Masseys	Hill	Do.
S. Hundley	Cannon	Grayson	Do.
T. C. Carlisle	Itasca	Hill	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
Hawley Gerrells	Indian Gap,	Hamilton	Texas.
L. M. Kingsley	Bosqueville	McLennan	Do.
John A. Eakins	Hico	Hamilton	Do.
Thomas F. Louder	Iredell	Bosque	Do.
H. C. O'Hara	Reno Centre	Reno	Kansas.
E. L. Drake	Kansas Centre	Rice	Do.
T. S. Hawkins	Centre City	Hamilton	Texas.
L. H. McKee	Robinson	McLennan	Do.
J. C. Wyatt	Speeglevi le	do	Do.
B. Franklin Abrams	277 Broadway, Brooklyn.		New York.
George G. Valentine	Kingsville	Johnson	Missouri.
I. D. Graham	Manhattan	Riley	Kansas.
William Ellison	Bazette	Navarro	Texas.
J. E. Bainfleld	Arrington	Atchison	Kansas.
F. J. Kirkham	Stranger	Falls	Texas.
L. W. Dennen	Havensville	Pottawattomie	Kansas.
E. W. Kenyon	Netawaka	Jackson	Do.
J. W. Lord	New Douglas	Madison	Illinois.
Benj. McElroy	Frankfort	Marshall	Kansas.
T. Y. Frost	Whiting	Jackson	Do.
D. G. Woodworth	Larkin	Atchison	Do.
H. C. Rogers	Gordonville	Grayson	Texas.
I. P. Allen	Pleasant Plain	Osborne	Kansas.
R. E. Guthrie	Guthriesville	York	South Carolina.
G. Pierce	Cottageville	Colleton	Do.
H. L. Brown	Invermay	Atchison	Kansas.
J. L. Hoskins	Hoskins	Rooks	Do.
Isaac Hoch	De Soto	Dallas	Iowa.
James Washburn	Buck Creek	Richland	Wisconsin.
Benj. Tripp	Grand Centre	Osborne	Kansas.
J. M. Fike	Stockton	Rooks	Do.
N. E. Blue	Ontario	Jackson	Do.
John L. Harvey	Marne	Cass	Iowa.
Jacob Kerper	New Vienna	Dubuque	Do.
P. A. Pope	Caledonia	Houston	Minnesota.
J. W. Beatty	Cascade	Dubuque	Iowa.
O. H. Carroll	Ross Station	Colleton	South Carolina.
Thos. L. Powers	Sterling	Rice	Kansas.
R. L. Rowe	Cherokee	Cherokee	Iowa.
J. H. Montgomery	Meadville	Crawford	Pennsylvania.
James Kelly	Wyoming	Marshall	Kansas.

APPENDIX 66 E.

Details relative to progress in bibliography.

[Prepared by Mr. C. J. Sawyer, Bibliographer].

I. SOURCES OF NEW TITLES.

	Number of titles.
Royal Society, Catalogue of scientific papers, vii, viii. L., 1877, '79	4,488
Reuss, Repertorium commentationum, iv, Physica. Gott., 1805	1,384
Poggendorff, Biographisch literarisches Handwörterbuch. Lpz., 1883. 2 volumes.	1,000
Hellmann, Repertorium der Deutschen Meteorologie. Lpz., 1883	5,200
Bibliographies, catalogues, &c., 141 volumes	1,487
Manuscript lists and bibliographies	1,082
Periodicals indexed, 2,203 volumes	5,697
Total added	20,338
Number on hand July 1, 1884, about	26,853
Total July 1, 1885, about	47,191

II. INSTITUTIONS AND INDIVIDUALS TO WHOM THE OFFICE IS INDEBTED FOR IMPORTANT CONTRIBUTIONS.

SPECIAL BIBLIOGRAPHIES.

Denmark: Manuscript, from C. Brunn, librarian Royal Library, Copenhagen.

German Empire: Dr. Hellmann has kindly permitted the incorporation of his admirable Repertorium.

Japan: Manuscript, from Dr. E. Knipping.

Norway: Manuscript, from Prof. H. Mohn.

Poland: Manuscript, from Dr. F. Karlinski.

Portugal: Manuscript, from J. C. de Brito Capello.

Roumania: Manuscript, from Dr. S. C. Hepites.

Russia: Manuscript, from Profs. H. Wild and A. Woeikof.

Spain: Manuscript, from Don C. Pujazon and M. Merino.

Styria: Manuscript, from Prof. R. von Miller-Hauenfels.

Sweden: Manuscript, from C. Annerstedt, librarian University Library, Upsala.

Victoria: Manuscript, from R. L. J. Ellery.

EXTRACTS FROM MANUSCRIPT CATALOGUES.

Library of the Deutsche Seewarte, from Dr. George Neumayer.

Library of the Central Anstalt, Vienna, from Dr. J. Hann.

Library of the Universiteit van Amsterdam, from Dr. H. G. Rogge.

Library of the Meteorological Office, London, from R. H. Scott.

Library of Yale College, from Prof. E. Loomis.

Astor, Boston Public, and Harvard College libraries, from their librarians.

The librarians of the American Philosophical Society, Academy of Natural Sciences, Ridgeway Branch of Philadelphia Library Company, and the Mercantile Library of Philadelphia; of the Peabody Institute and Johns Hopkins University, of Baltimore; and of the Library of Congress, have afforded special facilities for the collection of material.

Valuable printed catalogues have been received from the Nederlandsch meteorologisch Instituut, Utrecht; Ufficio centrale di Meteorologia, Rome; Osservatorio di Capodimonte, Naples; Société de Physique et d'Histoire Naturelle de Genève, through Prof. A. de Candolle; Service hydrometrique du Bassin de la Seine, Paris, through M. G. Lemoine; Akademie der Wissenschaften, Munich; Nicolai Haupt-Sternwarte, Pulkowa; Finska Vetenskaps Societeten, Helsingfors; Institution of Civil Engineers, London; American Philosophical Society, Franklin Institute, American Antiquarian Society, and others.

MISCELLANEOUS CONTRIBUTIONS.

Prof. G. J. Symons has added to his original catalogue a large number of anonymous titles; Dr. Sophus Tromholt has furnished a list of titles on the aurora; Lieut. Jules de Schokalsky, of the Russian Navy, has very kindly indexed for us the complete set of the Moskoi Sbornik, adding translations of titles; Prof. C. Pittei, of Florence, has contributed Italian titles; R. Mueller, director of the Hydrographic Office at Pola, an index to their publications.

In this country the late Dr. F. B. Hough furnished an index to the contents of volumes in his valuable library; Prof. M. W. Harrington kindly loaned his extensive card-working index for comparison; Dr. H. B. Baker indexed the publications of the Michigan State board of health, and many others have assisted in this work by short lists and valuable suggestions.

APPENDIX 67.

REPORT OF PHYSICAL LABORATORY DIVISION FOR 1884-'85.

The CHIEF SIGNAL OFFICER, UNITED STATES ARMY:

SIR: I have the honor to submit the following report of the principal operations of the Physical Laboratory Division for the year ending June 30, 1885:

This division was known as the Meteorological Observatory up to January 19, 1885. On that day the experimental laboratory, which was in process of formation, was consolidated with it, the name was changed as above, and the writer was put in charge, relieving Lieutenant Allen. Owing to this change, the report, in so far as it refers to the first six months of the year, cannot be so full and satisfactory as it would have been had Lieutenant Allen remained to aid in its preparation.

This division is charged with "the custody of all meteorological instruments, and their examination and repair; the preservation, comparison, and adjustment of standards and substandards; the testing of all instruments issued for station use, and the determination of their corrections; and with the inauguration of a system of measurements of atmospheric electricity, ground currents, and earth temperatures, and the supervision of men assigned to this work. To it may be referred any questions involving experimental research, and especially those pertaining to the subjects of electricity and heat." (Instructions No. 6, 1885.)

The total number of instruments of all kinds received by the division during the year was 1,945, of which over 1,600 were thermometers. This number includes all that were purchased by the office and all that were returned from stations for comparison, &c., and a small number received from private individuals. There were issued to stations and volunteer observers 2,045, and to private individuals 283, making a total issued of 2,328. Of the instruments issued, over 1,700 were thermometers. This statement does not include wind-vanes and rain-gauges, which until recently were received and issued by the property and disbursing officer without passing through this division.

During the year, 1,858 thermometers were compared with the office standards, and a correction card prepared for issue with each. Two hundred and thirty of these comparisons were made for private individuals. All of the barometers issued were compared with the standards, 160 barometer tubes were filled and boiled, and 109 barometers were repaired. Most of the self-registering instruments kept in what is known as the "instrument room" have been continuously at work during the year, and continuous registers of temperature, pressure, rain, and wind at this office have been filed away. Frequent comparisons with non-registering standards, the results of which are noted on the record sheets, render these records of great value, and it is only to be regretted that the Service is unable at present to largely extend the system of self-registry.

Plans for the improvement of the apparatus for the comparison of thermometers are now under consideration. Although the methods now in use are extremely satisfactory as to the results obtained, the apparatus is rather crude, and its use involves more time and labor than is actually necessary. There are still some thermometers in use in the service which have not been compared with the standards of the office.

The work of comparison has been carried on as rapidly as possible without a considerable increase in the stock of thermometers carried by the office, as it is always necessary to issue instruments to take the place of those called in.

The improvement of the rain-gauge used in the service is a subject to which much attention has been given during the year. As a result a new model gauge has been constructed, and, upon being recommended by the board on instruments, has been adopted. In the future all gauges issued will conform to this model.

The principal points of difference between this gauge and the old are a change in the material of the collector and the tube and a great increase in the strength and rigidity of the same. The collector is of heavy brass, 8 inches in diameter, beveled on the outside so as to give it a tolerably sharp edge. The tube into which the water flows is also of brass, thick and strong, 20 inches deep, and its diameter is such that the ratio of the area of the collector to that of the tube is as nearly as possible ten to one. A new stick has also been adopted, graduated much more accurately than the old and of a different kind of wood, which shows the water line much more distinctly and accurately. In cross-section it is so made as to be just 1 per cent. of the area of the tube. The new gauges will also be numbered and calibrated, so that a correction card can be furnished with each, and it is believed that their introduction will increase the accuracy of our observations of rainfall.

A new anemometer-support has been devised and adopted, which is believed to be a great improvement upon the old form. In the new support a cross-bar, upon which the anemometer rests, is run up and down a T-shaped bar of iron, by means of a chain, with which the observer controls the motion. The cross-bar is arranged to support two anemometers, so that monthly comparisons of the station and extra instrument can readily be made.

Arrangements are also made for the easy addition of a third arm, in order to facilitate comparison with anemometers carried by the inspectors. The adoption of this new support is thought to be an important step in the direction of a much-needed improvement in anemometry. Improvements in the anemometer itself are also under consideration, which will strengthen its weaker parts and diminish the number of damaged instruments annually returned to this office.

Experiments are in progress looking to the substitution of an iron cistern with metal plunger for the leather barometer cistern now in use. The latter are constantly giving way and the expense of repair is considerable.

The relative value of spherical and cylindrical bulbs for thermometers has been the subject of experiment and consideration. Tests of sensitiveness have been made in air and in water, and as dry and wet bulbs. In all experiments the superiority of the cylindrical bulb was demonstrated. The subject has been specially referred to Professor Ferrel and Junior Professor Russell, and although no formal report has as yet been made, it seems highly probable that the use of the cylindrical bulb in preference to the spherical will be recommended. Should the cylindrical bulb be adopted the change can be brought about gradually, and it will also enable the office to utilize a large number of cylindrical bulb thermometers, "hygro-tubes," so called, which were called in some time ago on account of not being stem-graduated.

Junior Professor Russell, who has had the subject of the standard of thermometry under consideration for two years or more, has nearly completed a paper containing an account of his work in detail and a full discussion of the whole question. The non-arrival of a few thermometers, specially made and compared at low temperatures with the Kew standards, is the cause of the delay in forwarding this paper to the Chief Signal Officer.

Reference has been made from time to time in the report of the Chief Signal Officer to the efforts of the office to establish a normal barometer. The continued illness of Junior Professor Waldo has prevented the preparation of a report which he was expected to make upon European standards, and the comparisons made by him of barometers belonging to this office with several of the most important normal barometers of Europe. Little progress has been made, therefore, during the year in this direction. The model constructed by Professor Wright, of New Haven, has been examined by the writer, and steps looking to the construction of a suitable cathetometer have been taken. The inincreased appropriation for the manufacture and repair of instruments, which became available on July 1, will enable the office, it is hoped, to carry out well-matured plans for the erection of this important instrument.

The subject of hygrometry and the improvement of hygrometric observations and tables has received the attention of the office for several years. In March, 1885, Junior Professor Marvin, attached to this division, was sent to Colorado Springs and Pike's Peak for the purpose of making a complete series of observations at various altitudes with various forms of psychrometer. He has made weekly reports to this office, giving the results of his work in detail. These results have been placed in the hands of Professor Ferrel, to whom the duty of discussing them has been assigned. The work thus far appears to be eminently successful. Professor Marvin will complete his observations on the mountain about August 10. After his return to this office it is intended to supplement the observations made at Pike's Peak and elsewhere by such experiments and researches in this laboratory as may seem desirable.

A series of four balloon ascents in the interests of meteorology were made by Private Hammon, attached to this division, in January, March, and April. The point of departure was in all cases Philadelphia, the dates and places of landing being as follows: First ascent, January 19, 1885. landing at Manahawken, N. J.; second ascent, March 13, 1885, landing near Birdsborough, Pa.; third ascent, March 27, 1885, landing at Tremley, near Rahway, N. J.; fourth ascent, April 16, 1885, landing at Williamstown, N. J.

The general instructions governing Mr. Hammon in these ascents were given by Professor Abbe, in charge of the study-room division. Mr. Hammon has made a full report of this work which has been referred to Professor Abbe for examination and remark.

When the writer was put in charge of the work of this division, two stations for the study of atmospheric electricity had already been established—one at Baltimore, in connection with the Johns Hopkins University, and the other at Cambridge, Mass., in connection with Harvard University.

The work of the observer at Baltimore, Private Park Morrill, was under the immediate supervision of Professor Rowland. At Cambridge the work of Privates McRae and McAdie was under the direction of Professor Trowbridge. At Baltimore, by means of a Mascart mirror electrometer, a continuous photographic record of the potential of the atmosphere has been maintained. Mr. Morrill, in Signal Service Note, No. XVII, has discussed the method of observation and has given the results of some studies of the connection between variations in potential and other meteorological elements. Experiments have also been made in the direction of the improvement of the water-dropping collector, or rather the substitution of a mechanical collector for the water dropper. The latter is practically useless in the winter season, and it is believed that a mechanical collector can be devised which will be equally as efficient at all times and suitable for use in all climates. Patterns have been made for one designed at Baltimore, and the construction of a model will probably be undertaken. Experiments have also been made at Baltimore to determine the best form of charging batteries for the electrometer, but no definite conclusion has yet been reached.

At Cambridge much attention has been given to the study of different forms of electrometers. Two instruments designed by Professor Trowbridge have been made and tested with very satisfactory results. Interesting experiments have also been made in determining the potential of the atmosphere by means of kites. These have been used in Cambridge and also on the summit of Blue Hill near Boston. At the latter point very high differences of potential between the earth and the string holding the kite were found, and some very interesting observations were made.

During the progress of this work at Baltimore and Cambridge Professors Rowland and Trowbridge have taken great interest in it and much of its success must be attributed to their hearty co operation with the service, and to the facilities so generously afforded by the authorities of Johns Hopkins University and of Harvard University.

Recently the subject has been taken up in the laboratory of this division. No attempt will be made for the present to secure a continuous photographic record as it seems more desirable to make at first a thorough investigation of instruments and methods. With that end in view several electrometers have been ordered, only one being available at present. Various questions connected with collectors, electrometers, exposure, &c., will be investigated. When uniform and satisfactory results are attainable and by the simplest means, the establishment of several additional stations in different parts of the country will be recommended.

The selection and construction of suitable thermometers for the measurement of ground temperatures has received a good deal of attention. Several forms of electric thermometer have been made the subject of experiment. A careful test of the thermo-electric method has shown that it is too uncertain in its results for general use. A form of resistance thermometer has been constructed which promises to give excellent satisfaction, and a new form of differential resistance thermometer has been devised which seems to possess many advantages over any other method. A practical test of these thermometers will be made at an early date which will be sufficiently prolonged to enable us to decide with certainty upon their efficiency.

There is great and pressing need for a suitable building in which the work of the physical laboratory division can be concentrated and rendered vastly more efficient. It is now carried on in several rooms, not connected with each other and all quite unsuitable for the work assigned to them. The constantly increasing demands which are made upon this experimental branch of the service can only be satisfied when ampler room and better facilities are afforded. It must constantly be a source of regret that, in the present condition of the division with its limitations as to room and facilities, it is impossible to take up some of the most important experimental problems which arise in the service.

Respectfully,

T. C. MENDENHALL,
Professor and Assistant-in-charge of Physical Laboratory Division.

JULY 27, 1885.

APPENDIX 68.

REPORT OF OFFICER IN CHARGE OF PROPERTY AND DISBURSING DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 15, 1885.

SIR: I have the honor to submit the following statement of the work of the Property and Disbursing Division for the fiscal year ended June 30, 1885, as required for the Annual Report of the Chief Signal Officer.

No changes of importance have occurred in the *personnel* of the division since last report.

Two hundred and twelve dollars and thirty-five cents have been received, during the year. from the sales of maps and bulletins, as allowed by the act of Congress approved March 30, 1874 (section 227, Revised Statutes).

In the "settlement of accounts room" the pay accounts of the entire corps have been examined, prepared for settlement, and through this room settled, aggregating 10,278 accounts.

The number of accounts growing out of the disbursement of the regular appropriations expended by this office, settled during the year, has been 7,976, making an average number per month of 664. This is caused by the large number of stations and the character of the accounts incurred at each, they being for small items of rent, hire, &c., which require monthly or quarterly payment.

The improved methods of administering the duties of this division have continued, and have resulted in the gratifying fact that the accounts pass the very critical scrutiny of the accounting officers of the Treasury with few suspensions, and these for mere technical informalities.

One of the reforms instituted by me was to pay all vouchers by checks drawn to order, in no case to bearer, that mode being considered the safest, not only of transmitting money, but it also furnishes the assurance (as the checks have to be indorsed by the person in whose name drawn before payment) that the money reaches the person for whom intended.

The advantage afforded to obtain greater accuracy by having instruments compared with our standards for which no extra charge is made, still continues to induce many private persons, institutions of learning, &c., to purchase instruments through this office, and during the year there have been 247 instruments of various kinds purchased, representing a total cost of $1,888.55. These transactions have no connection with the public funds disbursed by me.

Six hundred and seventy instruments of various kinds have been purchased during the year for the use of this service, and 1,639 have been issued since last report.

The average cost of maintaining each station of observation during the year, including cost of printing stations and additional cost of life-saving stations, but exclusive of the cost of telegraphic services and the pay and allowances of the men on duty at each, has been $329.54, but this cost, as well as that reported in previous reports, represents only the amount spent at each station, and is therefore calculated to convey an erroneous impression; the absolute average is about $1,500 per annum for each station (which includes all expenses, except pay and allowances of the men).

The total number of letters received during the year was 37,954, an increase over last year of 5,445 letters; the total number of letters sent was 33,330, and 2,710 indorsements, an increase in letters sent of 4,482 over last year.

In the "packing and shipping room" there were 18,080 distinct shipments made, through the Quartermaster's Department, by express, and by mail, with not an article lost in transit.

There were received, during the year, 5,241 packages.

The usual quantity of work has been done in the "machine shops," in manufacturing and repairing meteorological and other instruments, and in repairs about the office.

The "carpenter shop" has been kept busy in making the necessary packing boxes for shipment of supplies, &c., and jobbing and repairs about the office.

The "library" has received during the year by purchase, exchange, or gift, 1,027 books, and now contains 9,743 volumns.

The condition of the appropriations (disbursed by this office) for the fiscal year ending June 30, 1685, with expenditures thereunder and balances unexpended at the end of the year, with probable demands on such balances as required to be rendered by act of Congress approved May 1, 1829, is as follows:

APPROPRIATED.

Observation and report of storms	$241,000 00
Expenses Signal Service, United States Army	5,000 00
Maintenance and repair military telegraph line	24,000 00
Establishing stations, Island of Nantucket	40,000 00

EXPENDED.

Observation and report of storms	$146,546 02
Expenses Signal Service, United States Army	1,578 37
Maintenance and repair military telegraph line	19,768 02
Establishing station, Island of Nantucket	----------

BALANCES.

Observation and report of storms	$94,453 98
Expenses Signal Service, United States Army	3,421 63
Maintenance and repair military telegraph line	4,231 98
Establishing stations, Island of Nantucket	40,000 00

PROBABLE DEMANDS.

Observation and report of storms	$60,000 00
Expenses Signal Service, United States Army	3,421 63
Maintenance and repair military telegraph lines	4,231 98
Establishing stations, Island of Nantucket	40,000 00

On July 1, 1884, there were employed in the division, 74 men (40 enlisted and 34 civilians, the latter including all messengers and laborers); on June 30, 1885, there were only 67 men (35 enlisted and 32 civilians, the latter including all messengers and laborers), showing a decrease of 5 enlisted men and 2 civilians.

At the close of the fiscal year ending June 30, 1884, there were 60 telegraph stations in operation, 4 having been closed during the year ending June 30, 1885, and 2 having been added, making a total of 77 stations in operation on June 30, 1885, reporting to this office.

The receipts from the 77 stations during the year were $16,389.50, of which the sum of $8,332.63 was collected for and paid to other lines.

The money value of "free business" (official messages), if paid for, would have been $10,695.90.

During the year 5,080 forms have been received from the telegraph stations and examined.

The amounts appropriated under the different heads for the support of the Signal Service, United States Army, for the fiscal year ending June 30, 1885, are as follows:

Legislative, executive, and judicial:	
Regular clerks, messengers, &c	$10,660 00
Scientific experts, clerks, &c	45,000 00
Postage-stamps Postal Union countries, allotted by the Secretary of War	1,080 00
Stationery, allotted by the Secretary of War	3,583 34
Contingent expenses, allotted by the Secretary of War	7,017 49
Rent of buildings for Signal Office	7,000 00
Total	74,340 83
Sundry Civil expenses:	
Observation and report of storms:	
Manufacture, purchase, and repair of instruments	$5,500 00
Telegraphing reports	136,000 00
Expenses storm signals	10,000 00
Cotton-belt reports	7,000 00
Connection life-saving stations	5,500 00
Instrument shelters	2,000 00
Rents, &c., of offices outside of Washington	40,000 00
River and flood reports	10,000 00
Maps and bulletins	25,000 00
Total	341,000 00
Maintenance and repair military telegraph lines	24,000 00
Stations at Nantucket Island	40,000 00

Support of the Army:		
Expenses Signal Service, United States Army	$5,000	00
Pay, &c., of the Signal Corps:		
Pay of officers	30,500	00
Pay of enlisted men	200,000	00
Mileage to officers	5,000	00
Cost of telegrams	250	00
Pay of contract surgeon	1,200	00
Commutation of quarters to officers	8,208	00
Total	245,158	00
Subsistence Department:		
Subsistence and commutation of rations, Signal Corps	155,000	00
Quartermaster's Department:		
Regular supplies:		
Fuel	6,200	00
Commutation of fuel at $9 per month	23,760	00
Commutation of fuel at $8 per month	23,328	00
Forage for animals	3,100	00
Straw for animals	217	00
Straw for bedding	46	08
Stationery at Fort Myer	100	00
Stores and repairs to heating apparatus	600	00
Lights at Fort Myer	300	00
Total	57,651	08
Incidental expenses:		
Office furniture, Fort Myer, Virginia	100	00
Horse and mule shoes	500	00
Blacksmiths' and other tools	400	00
Veterinary supplies	300	00
Fire apparatus and disinfectants	200	00
Total	1,500	00
For interment of officers and men	200	00
For apprehension of deserters	120	00
Transportation:		
Materials and funds	25,000	00
Men	8,875	00
Means of transportation, mules	1,000	00
Means of transportation, harness	130	00
Means of transportation, repairs to	500	00
Total	35,505	00
Barracks and quarters:		
Commutation of quarters	84,108	00
Work and supplies at Fort Myer, Virginia	1,500	00
Work and supplies on hospital	300	00
Total	85,908	00
Clothing, camp and garrison equipage:		
Six wall tents, &c	415	80
Issues in kind	4,900	00
Total	5,315	80
Medical Department:		
Medical attendance, &c., officers and men	5,000	00
Medical attendance, &c., officers with Signal Corps	100	00
Medical and hospital supplies, Fort Myer	700	00
Medicine from depots, &c	1,000	00
Material for repairs to hospital	200	00
Total	7,000	00
Printing and binding (allotted by Secretary of War) about	40,000	00
Grand total	1,017,698	17

The appropriation for fuel was not sufficient for our stations, many of which, in the extreme northwest country, require fires the year round, and in those latitudes the cost of fuel is proportionately high; the officers of the service have been allowed, by paragraph 1851 Army Regulations, to purchase fuel at a fixed rate, the Government paying the difference, but, by the insufficiency of the appropriation mentioned, this privilege has been denied to them for a portion of the time.

As questions have arisen as to the law under which the printing of the professional papers, &c., of this service is done, I would suggest that Congress be asked to appropriate hereafter, specifically in the appropriations, both for "maps and bulletin" and for "printing and binding," using the language of our estimates. (See pp. 180 and 199, Ex. Doc. No. 5, H. R., 48th Congress, second session.)

In regard to my responsibility for the property belonging to this service, I would say that under the present rules each article purchased is taken up on a property report which is rendered quarterly to the Chief Signal Officer for transmission to the Third Auditor of the Treasury, so that not one article, from the merest trifle to the most expensive instrument that is bought, but what is carefully reported every three months to the accounting officers of the Treasury; and when it is considered that the property is scattered over the United States at all the stations of this service, and that frequent inventories have demonstrated the absolute accuracy of my reports, the vast amount of care required to produce such a result can be more readily appreciated.

In connection with the above I would say that the store-houses for the valuable instruments and other property at this office are leaky, wooden sheds, entirely inadequate, insecure, and unsafe for the storage of valuable Government property; and as during the year a fire in one of the buildings occupied by this office came near destroying a very valuable lot of records (it did destroy considerable furniture and instruments), I would invite attention to the estimate, twice before submitted to Congress, for the purchase of a site and the erection thereon of a fire-proof building for offices suitable for the uses of the Signal Service, as per plan and estimate contained in Senate Ex. Doc. No. 152, Forty-eighth Congress, first session, and would suggest that said estimate be again submitted and, for the reasons given, an appropriation urged.

As Special Orders No. 90, Adjutant-General's Office, 1885, relieved me, at my request, on the 30th day of June, 1885, from duty at this office, it is proper for me to say, in transferring the duties of my division to my successor, that the work is well up to date, except in one or two cases of indexing and in the completion of the inspection reports of the officers recently returned from inspection tours; but in these cases the additional labor of a complete inventory incident to the transfer, as well as a somewhat limited force of clerks, are the causes.

I would call to the attention of the Chief Signal Officer the efficient service rendered me by my chief clerk, Mr. W. R. Bushby, and the chiefs of subdivisions and other men employed in this division.

They are, generally speaking, all good, deserving men.

Very respectfully, your obedient servant,

S. M. MILLS,
Captain, Fifth Artillery,
Late P. and D. Officer, Signal Service, U. S. A.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 69.

REPORT OF OFFICER IN CHARGE OF EXAMINER'S DIVISION.

SIGNAL OFFICE,
Washington City, July 16, 1885.

SIR: In accordance with instructions contained in Memorandum No. 121, dated Signal Office, July 7, 1885, I have the honor to submit the following report for the fiscal year ending June 30, 1885.

The examiner's division, which was instituted by Instructions No. 176, series of 1881, was at the beginning of the fiscal year under charge of First Lieut. P. H. Ray, Eighth Infantry, Acting Signal Officer, United States Army, and so continued until March 6, 1885, when I assumed charge, in accordance with Memorandum No. 35, dated Signal Office, March 2, 1885.

Sergt. Otto Holtnorth was chief clerk until December 20, 1884, when he was relieved from duty in the division, Sergt. James B. Newlin being assigned to succeed him by memorandum dated Signal Office, December 27, 1884.

Besides the chief clerk the regular working force of the division consists of one civilian and one enlisted clerk; but on April 29, 1885, two additional men were temporarily assigned to assist in bringing up the back work of the division, which at the time I assumed charge was in most particulars from six to eight months behind. With the assistance of these men and the steady, industrious work of the regular force the work (with a few exceptions, where irregularities exist, which are in course of adjustment) has been brought up to date.

One of these men was relieved on June 26 and returned to the division from whence he came, his services being no longer needed, and the other one continued on duty at the close of the year.

The work performed during the year is briefly set forth in the following summary.

Summary.

Month.	Returns of signal equipments and stores examined and forwarded to the United States Treasury.	Letters sent in connection with the examination of money and property-returns.	Letters received and recorded.	Requisitions for purchases and expenditures received, examined, and recorded.	Purchase-vouchers audited and recorded.	Expenditure-vouchers audited and recorded.	Accounts current, line receipts examined and forwarded to the United States Treasury.	Weekly statements of public funds recorded and verified.	Accounts current of Capt. S. M. Mills, property and disbursing officer, for appropriations audited and forwarded to the United States Treasury.	Accounts current for sales at auction, audited and forwarded to the United States Treasury.
1884:										
July	30	359	227	474	105	716	10	20	2	0
August	160	283	75	352	98	589	18	16	2	0
September	58	161	93	298	143	780	5	20	4	0
October	102	367	239	294	122	731	5	14	0	0
November	0	83	105	222	153	656	8	15	2	0
December	13	86	120	349	230	519	0	14	0	0
1885:										
January	48	305	262	305	147	574	0	10	0	0
February	185	300	106	190	135	294	0	12	1	0
March	152	319	100	288	149	455	5	13	1	3
April	111	398	271	281	118	489	2	14	1	0
May	124	368	135	237	161	415	4	11	5	0
June	29	145	111	165	8	201	0	14	2	0
Total	*1,012	3,174	1,844	3,455	1,569	6,419	*57	173	*20	3

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* These figures do not, however, represent the actual number of papers handled, as in nearly every instance the returns and accounts are accompanied by numbers of vouchers and sub-vouchers varying from one or two to upwards of a thousand in some of the money accounts of Capt. S. M. Mills, Fifth Artillery, property and disbursing officer, where the number of papers pertaining to each account has averaged about eight hundred, or about sixteen thousand papers for the twenty accounts of his examined during the year, which do not appear as a separate item in the summary.

The duties of the examiner's division consist in a careful scrutiny of all letters of authority (technically termed requisitions) and vouchers, and a thorough and complete examination of all money accounts and property returns pertaining to the Signal Service previously to forwarding them to the Third Auditor of the Treasury.

Formal letters of authority (requisitions) for all purchases and expenditures are prepared by the property and disbursing officer and sent to the examiner's division, where, if after examination they are found to be proper and according to regulations, they are, if for a less sum than $100, indorsed on their faces, "E. O. No. —. By order of the Chief Signal Officer," and signed officially by the examining officer; but those for $100 and over are signed by the Chief Signal Officer, and are then given an E. O. No. —, and recorded. After being passed by the examiner, the letters of authority are returned to the property and disbursing officer.

In cases where bills are rendered for amounts greater than the letter of authority calls for, if after examination the account is found to be correct, and the additional amount was inseparable from the amount authorized, and could not have been anticipated, the letters of authority are, on request of the property and disbursing officer, stamped "Increased, by order of the Chief Signal Officer, from $——— to $———," and officially signed by the examining officer, and are then returned to the property and disbursing officer.

All vouchers are carefully examined with the original bills and letters of authority, and when satisfied that the articles purchased have been delivered, or that the services charged for have been rendered, or that payment has been ordered under the signature of the Chief Signal Officer, where no previous authority exists, those for sums of less than $100 are stamped "Approved. $———. By order of the Chief Signal Officer, E. O. No. —," and officially signed by the examiner, and are then returned to the property and disbursing officer for payment.

All vouchers for $100 and over when found to be correct are approved under the autograph signature of the Chief Signal Officer, and in no case is a voucher approved where its amount exceeds that of the original letter of authority.

Telegraph services are rendered without formal requisition, and the original bills for the same, after having been examined, corrected, and audited by the officer in charge of the telegraph division, and after having received the approval of the Chief Signal Officer, are, together with vouchers prepared by the property and disbursing officer, sent to the examiner's division, where, after proper scrutiny, the vouchers are, if found correct, stamped for approval in the same manner as for other vouchers.

All vouchers as well as requisitions are recorded in serial order, beginning with No. 1, at the commencement of the calendar year, the purchase vouchers being recorded in the record of purchases, and those for expenditures in the record of persons and articles hired. All money accounts of officers of the service disbursing public money are examined as to their correctness, and to see that all regulations of the Treasury and the office, as laid down in Instructions No. 15, dated Signal Office, March 1, 1885, are complied with. All differences are noted, and at the end of the examination a statement of them is furnished to the officer accountable, and the account is held until the differences have all been adjusted.

The purchases pertaining to each account are checked off on the property return of the officer making them, to see that everything is properly accounted for, and the expenditures on the descriptive lists of persons and articles hired, of the officer, to be assured that the services charged for are properly reported.

The expenditure vouchers of the property and disbursing officer are checked off on the record of persons and articles hired (which corresponds with the descriptive lists of persons and articles hired of other officers) in this office, annotation being made in connection with each service, in a column for the purpose, in red ink, as for example, viz: "V. 45—6-25-85.—M.," which indicate that the account was paid on voucher No. 45, on June 25, 1885, by Capt. S. M. Mills, and that the voucher so paid pertains to his June, 1885, accounts as the date indicates.

When this has been done, the services are considered as reported, as per instructions from the Chief Signal Officer, dated February 24, 1885.

After differences have been adjusted and all regulations complied with the accounts are forwarded by letter of transmittal to the Third Auditor of the Treasury, with a statement that the accounts have been examined and found correct.

The returns of officers responsible for Signal property (of which there are upwards of 200) are examined by seeing that all property on hand at the last return is correctly carried forward to the next succeeding return; that all property received (from whatever source) is taken up and accounted for; that all property dropped is done so on proper and legal vouchers, and that the amount on hand to be accounted for is correctly stated.

When the correctness of returns has been ascertained those for the preceding quarter are forwarded to the Third Auditor of the Treasury for settlement, and those for the current quarter held to see that the property on hand is properly carried forward to the next subsequent return.

I am, very respectfully, your obedient servant,

FRANK GREENE,
Second Lieutenant, Signal Corps, U. S. A.

The CHIEF SIGNAL OFFICER, UNITED STATES ARMY.

APPENDIX 70.

REPORT OF OFFICER IN CHARGE OF PUBLICATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, D. C., July 1, 1885.

SIR: I have the honor the submit the following report relative to the publications division for the fiscal year ending June 30, 1885:

The work of the division naturally consists of three distinct classes of labor, draughting, printing, and distribution, each of which has been assigned to an appropriate subdivision, whose employés are specially fitted to perform their respective duties. The general work of the division has been materially increased during the year. This is due chiefly to the greater demand, both at home and abroad, for the publications of the Service, which has necessitated larger editions and proportional increase in labor. The following synopsis of the work performed in the respective subdivisions is respectfully submitted:

DRAUGHTING ROOMS.

During the year the employés herein have reduced by pantograph 2,500 maps, constructed and drawn 610 maps and charts, prepared for transfer to stone 560 maps, and mounted 125 maps; and the sergeant in charge (chief draughtsman) has examined and compared 400,000 maps and charts after they had been printed. In addition to these meteorological data, collected from stations of observation distributed over the entire northern hemisphere and from vessels crossing the seas, have been entered upon maps specially designed therefor; and isobars and isotherms drawn thereon for every day in the year. Monthly means have also been deduced from these daily observations and charted for each month in the year.

PRINTING ROOMS.

The following tabular statement will show the work performed herein:

Publication.	No. printed.	Publication.	No. printed.
Daily Bulletin of International Observations	184,184	Post-office wrappers	2,636,900
Summary and Review of International Observations	7,380	Envelopes	576,060
Monthly weather review	30,890	Forms (miscellaneous)	415,610
Midnight synopsis and special bulletin	152,754	Letters	19,000
Professional papers	3,500	Letter-heads	8,350
Signal Service notes	22,650	Special bulletins (monthly)	2,115
History of the Service	5,000	Address slips	50,400
Tornado circulars	6,250	Cold-wave circulars	18,000
General orders	44,750	Advance annual reports	1,500
Special orders	17,785	Instructions to special river observers	600
Instructions	18,000	Telegraphic cipher river reports	1,000
Circulars	13,650	Useful information for ship-masters	3,000
		Reports, Alabama weather service	24,000
		Miscellaneous papers	56,049

The work in this subdivision shows a slight increase over that of the preceding year, and experience, better quality of paper, inks, &c., and closer attention to details have produced a marked improvement in its execution. Some new material has recently been added which it is hoped will within the coming year tend to further advancement in this respect. The blank-work of the office has been so much increased during the year as to have added materially to the labor of the subdivision, but it has been handled promptly and executed creditably considering the fact that the machinery in general is old and worn from long-continued usage and must soon be replaced.

There have also been lithographed 745,260 base-maps, 669,823 maps and charts (miscellaneous), 119,935 forms and blanks (miscellaneous), 133,380 letters and letter-heads.

There has been a decided improvement in the lithograph work since my last report, and that now executed at this office is creditable to the service, and will compare favorably with that of any other department or private firm.

DISTRIBUTING ROOMS.

The work of this subdivision has been much increased within the past year. Applications for the publications of the Service have been steadily increasing in number and it has now become necessary to devote both considerable time and labor to their consideration and also to exercise much discretion in action thereon.

The special feature of the work of this subdivision has, however, been the opening of new records, which has entailed a large amount of clerical and other labor, as it was necessary to select from a large number of correspondents, both foreign and domestic, those who were properly entitled to receive the full series of the respective publications, and then to transfer both their names and addresses to the permanent lists therefor. Much care and discrimination have been used in this work, and it is believed that as soon as it has been entirely completed (which it is expected will be done at an early date) the system of record will be found convenient, practical, and well adapted to the requirements of the division. The regular issue of all current publications have been made as promptly as practicable, and in addition to these, surplus Signal-Service notes and professional papers which remained on hand after the regular recipients had been supplied were distributed as judiciously as possible, chiefly among that worthy class, voluntary observers, who could properly appreciate their value, and by whom it was thought they would be regarded both as a slight recognition of their services and an incentive to future effort. The arrangement of the retained publications in suitable order has been continued and the "Reserve Publications" are next to be taken up as soon as time and opportunity permit.

The division in general is now believed to be in much better condition than at the close of my last report. Without entering specially into details I may state that modes of operation have been adopted which are better suited to the work to be done and which have materially lessened the labor. The usual series of publications has been continued, and while it was necessary, in consequence of the greater public demand, to increase the editions, due attention has also been paid to to their contents, the scope of which has been much extended and the subject-matter, it is believed, proportionally improved. There is still ample room for improvement; but it is thought that the division as now organized will be found capable within the coming year of the proper and creditable performance of the duties that may devolve upon it.

The total number of employés in the division at the close of the year is 44, consisting of 29 enlisted men and 15 civilians, classed as follows:

Clerks	4
Draughtsman in charge	1
Draughtsmen	4
Printer in charge	1
Printers	13
Lithographers	4
Proof-reader	1
Pressman	1
Pressboys	6
Stitchers and folders (3 only on temporary duty)	6
Engineers	1
Messengers	1
Laborers	1
Total	44

S. M. MILLS,
Captain Fifth Artillery, A. S. O., &c., in charge Publications Division.

The CHIEF SIGNAL OFFICER OF THE ARMY.

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